

# Catalogue of the type and figured specimens of fossil Asteroidea and Ophiuroidea in The Natural History Museum

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## INTRODUCTION

This is a catalogue index of the type and figured fossil starfishes and brittle-stars in the collections of the Department of Palaeontology, The Natural History Museum, London, and is complete up to May 1990. Only primary types have been included (i.e. holotype, lectotype, syntype, neotype), whether figured or not. Paratypes have been included only if they have been figured.

Like the preceding catalogue on the type and figured fossil Echinoidea (Lewis, D. N. 1986 *Catalogue of the Type and Figured Specimens of Fossil Echinoidea in the British Museum (Natural History)*), it is divided into three parts. In the first part, which is divided into Asteroidea and Ophiuroidea, the genera are arranged alphabetically, with all the information about each specimen included therein. The second part is a bibliography of the works referred to in each entry. The third part is an alphabetical index of species, each being paired with the genus in which it is placed in the first part of the catalogue. The index also contains generic synonyms to which species had been previously assigned; these are printed in italics. At the end of the catalogue there are figures of type specimens which were not figured either in their original descriptions, or in subsequent publications.

The generic assignment of each species in the main entry of this catalogue is the name in current use for storage of the specimens in the collections. Where a name has been changed from that in a description or figuring, the original name is cross-referenced to the current name, where details of the specimen will be found.

The registration number of most specimens is prefixed by 'E' which refers to the registers (or catalogues) of fossil echinoderms in the Department of Palaeontology; no other invertebrate phylum has this prefix letter. Some registration numbers have the prefix 'OR' which refers to an older series of registers (Old Register) in which specimens of *all* phyla were registered. From the Spring of 1990, computerised registration of specimens commenced and the prefix 'EE' is given to registration numbers. However, there are no 'EE' prefixes in this catalogue.

Unless replicas of specimens have actually been figured, all the entries in the catalogue refer to real specimens.

Locality details are recorded in the catalogue as they appear in the register entry, on specimen labels and in the references. No county or country names have been brought up-to-date, as such alterations can be misleading or even incorrect. Stratigraphic

details are recorded as they appear in register entries, references, and on specimen labels, and where possible have been brought up-to-date with current stratigraphic usage.

Records which include references to monographs published over a number of years by several authors, include in the entry the range of dates of the monograph. This is followed by a single date and the pagination for the record (e.g. Sladen, W. P. & Spencer, W. K. (1891-1908) 1905: 77, pl. 21 figs 2, 2a). The exact authorship can be found in the bibliography. Similarly, records which include references to monographs published over a number of years by a single author, include in the entry the range of dates of the monograph. This is followed by a single date and the pagination for the record (e.g. Spencer, W. K. (1914-1940) 1922: pl.16 fig.1). Because these monographs are frequently referred to by unofficial titles (e.g. 'Sladen & Spencer's Monograph', 'Spencer's Palaeozoic Monograph') this is probably less confusing than giving the actual author and date (e.g. Spencer, W. K. 1905: 77, pl. 21 figs 2, 2a).

It is inevitable that over a number of years information about specimens, or even specimens themselves, may be lost, particularly if collections are moved from place to place for various reasons. Fossils may also suffer from less than adequate storage methods and undergo decay. A prime example of this is a specimen of *Coulonia colei* (Forbes), a syntype of *Astropecten crispatus* Forbes, number OR 57501, figured herein, which was destroyed by pyritic decomposition probably as long ago as the 1920s. Included with the specimen are notes of treatment given to it in 1919, indicating that deterioration had already commenced.

The catalogue was compiled firstly on index-cards, then entered into the Museum Data-base System (MDS) via an Olivetti M 290 micro-computer linked to an Olivetti M 380 multi-user computer. MDS was devised and developed by Museum staff, principally by Mr. David French, and allows an ordered entry of data, with repeatable fields, into a data-base package written in 'C' under the 'Unix' operating system. Subsequent manipulation of data, report generation, and editing, can be carried out easily using the MDS. Editing can also be effected by conversion of the data to WordPerfect word-processing. A version of MDS is available for use on IBM AT and compatible micro-computers using MS-DOS.

I wish to thank Mr. Adrian Rissoné of the Department of Palaeontology for his considerable and essential help in all matters relating to the computers, Mr. Phil Hurst and Mr. Phil Crabb of the photographic staff of the Museum for the photographs and to Dr. Andrew Smith for helpful criticism.

## TYPE AND FIGURED FOSSIL ASTEROIDEA

### A

#### *Archastropecten cf huxleyi* (Wright)

E 28383 See: *Pentasteria* (*Archastropecten*) *cf huxleyi* (Wright)

#### *Archastropecten huxleyi* (Wright)

OR 33848 See: *Pentasteria* (*Archastropecten*) *huxleyi* (Wright)

#### *Archastropecten portlandicus* Hess

E 13739, E 13740a See: *Pentasteria* (*Archastropecten*) *portlandicus* (Hess)

#### *Archophiactis grayae* Spencer

E 52489 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 361, 362, 363, 364, text fig. 234, pl. 24 fig. 2 as *Archophiactis grayae* Spencer.

E 52642 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 356, 361, 362, text fig. 233A, 364, pl. 24 fig. 5 as *Archophiactis grayae* Spencer.

E 52693a,b **Holotype** of *Archophiactis grayae* Spencer. Type species of *Archophiactis* Spencer 1927: 361. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1927: 361, 362, 363, pl. 24 fig. 4 (E 52693a); 356, 361, 362, 364, text fig. 232A, pl. 24 fig. 3 (E 52693b) as *Archophiactis grayae* Spencer.

#### *Arisaigaster leintwardinensis* (Spencer)

E 13153 **Holotype** of *Mesopalaeaster*(?) *leintwardinensis* Spencer. Silurian. Lower Ludlow Shales. Leintwardine, Hereford, England. Colld Morton, G. H. Purchd of Miss Morton July 1900. Type figd Spencer, W. K. (1914–1940) 1916: 89–90, text fig. 49; 1919: 179, pl. 2 fig. 5 as *Mesopalaeaster*(?) *leintwardinensis* Spencer.

#### *Arthraster cristatus* Spencer

E 13252 Cretaceous, Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 140, 177, pl. 16 fig. 7.

E 20266 **Holotype**. Cretaceous, Santonian, *coranguinum* Zone. Micheldever, Hampshire, England. Blackmore, H. P.

Colln. Presd Trustees, Salisbury Museum January 1935. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 93, pl. 29 figs 10, 10a,b.

#### *Arthraster dixonii* Forbes

E 5024 Cretaceous, Upper Santonian. *Marsupites* band. Cliffs, east of Brighton, Sussex, England. Presd McPherson, W. 3rd May 1902. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 91, pl. 29 figs 11, 11a.

OR 47000 **Holotype**. Type species of *Arthraster* Forbes 1848: 467. Cretaceous, Cenomanian. Lower Chalk. Balcombe Pit, near Amberley, Sussex, England. Dixon, F. Colln 1850. Type refd Forbes, E. 1848: 467. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 369, 370, 440, pl. 23 fig. 1. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: pl. 18 figs 1, 1a; 1907: 91–93.

#### '*Asterias*' *gaveyi* (Forbes)

E 1638 **Holotype** of *Uraster gaveyi* Forbes. Jurassic, Pliensbachian, *capricornus* Zone. Middle Lias. Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. Wright, T. Colln. Purchd Butler, F. H. May 1887. Type figd Forbes, E. 1850b: 1–2, pl. 2 figs 1,2 as *Uraster gaveyi* Forbes. Figd Wright, T. (1863–1880) 1863: 100–101, pl. 1 figs 1a,b as *Uraster gaveyi* Forbes.

#### *Astropecten armatus* Forbes

OR 57503 See: *Coulonia colei* (Forbes)

#### *Astropecten cotteswoldiae* Buckman

E 1633, E 1634, E 1635, E 1636 See: *Pentasteria* (*Archastropecten*) *cotteswoldiae* (Buckman)

#### *Astropecten cotteswoldiae* var. *stamfordensis* Wright

OR 75797 See: *Pentasteria* (*Archastropecten*) *cotteswoldiae* (Buckman) var. *stamfordensis* (Wright)

#### *Astropecten cotteswoldiae* var. *stonesfieldensis* Wright

E 2588 See: *Pentasteria* (*Archastropecten*) *cotteswoldiae* (Buckman) var. *stonesfieldensis* (Wright)

#### *Astropecten crispatus* Forbes

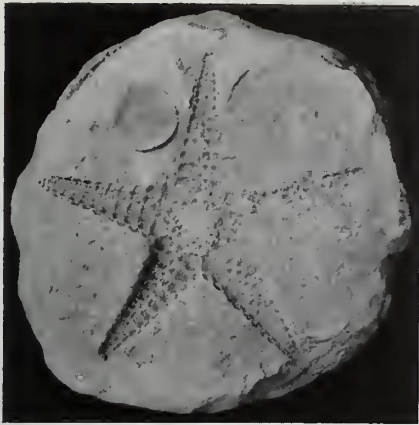
OR 57501 See: *Coulonia colei* (Forbes)

#### *Astropecten granulatus* Rasmussen

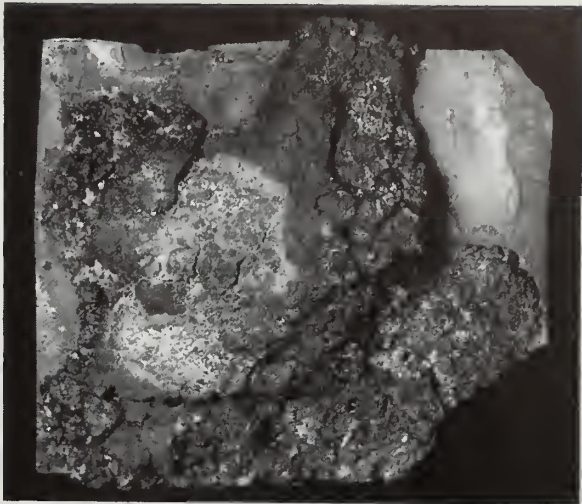
E 53626,28–29 Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A.G. Colln. Figd Rasmussen, H. W. 1972: pl. 3 figs 5a,b (E 53626), 7a,b (E 53628), 8a,b (E 53629). E 53629 was noted missing in May/June 1973 during curation and has not been found.

- Fig. 1 *Siluraster caractaci* (Gregory), E 52857a,b, holotype, from the Ordovician, Caradoc, of Church Stretton, Shropshire: (a) aboral; (b) oral views of the specimen in the nodule. The specimen was photographed, lightly coated with ammonium chloride sublimate. Mag. x 1.8.
- Fig. 2 *Stauranderaster gibbosus* Spencer, E 13239, holotype, from the Cretaceous *A. quadratus* zone, of Rottingdean, Sussex; two views of the specimen showing considerable disruption of the structure: (a) aboral view; (b) oral view. Mag. x 0.9.
- Fig. 3 *Coulonia colei* (Forbes), OR 57501, syntype of *Astropecten crispatus* Forbes, from the Eocene, London Clay, of the Isle of Sheppey, Kent. Compare its present condition with the original figuring by Forbes, 1849, pl. 3 fig. 3a. This is a prime example of what happens to some specimens when storage conditions are inadequate; even the labels were affected by the decomposition of the specimen, but fortunately not sufficient to erase all data. Mag. x 0.9.
- Fig. 4 *Ophiura wetherelli* Forbes, E 2670, syntype, from the Eocene, London Clay, of the Isle of Sheppey, Kent. This was not the specimen figured by Forbes even though a label with the specimen says so. The first figuring of the specimen was by Busk, 1866, pl. 12 figs 4a–d, but although the figure is too small to be useful, it does show that the specimen was not the one figured by Forbes. Mag. x 2.7.
- Fig. 5 *Ophiura wetherelli* Forbes, E 2650, ?syntype, from the Eocene, London Clay, of Highgate Archway, north London. This block contains many specimens throughout its structure and is one of three blocks from the same locality and from the Wetherell Collection. It is probably one of the specimens referred to by Forbes and if so, is a syntype. Mag. x 1.8.





1a



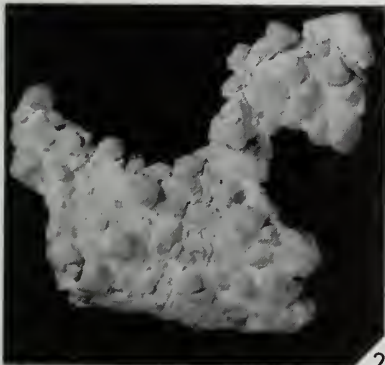
3



1b



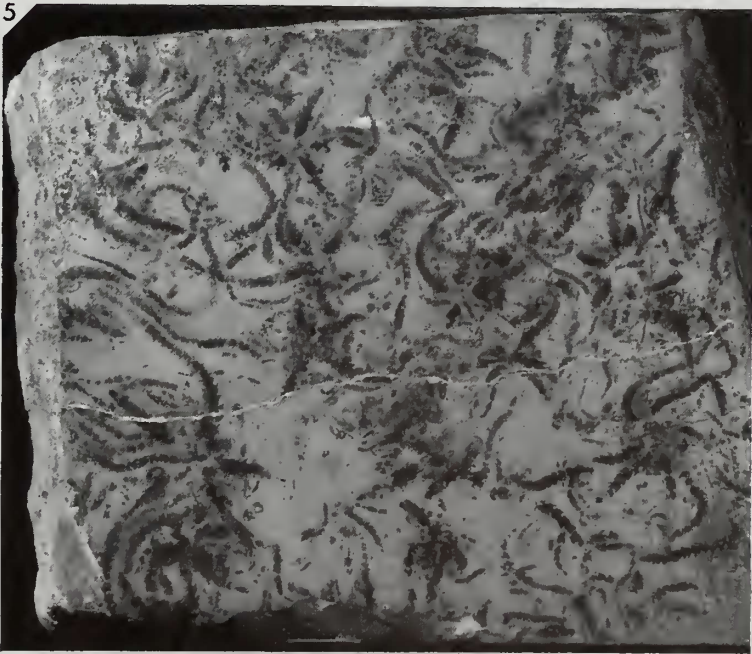
4



2a



2b



5

**E 53627 Holotype.** Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A.G. Colln. Type figd Rasmussen, H. W. 1972: 38–40, pl. 3 figs 6a,b.

***Astropecten huxleyi* Wright**

**OR 33848** See: *Pentasteria* (*Archastropecten*) *huxleyi* (Wright)

***Astropecten lorioli* Wright**

**E 1639** See: *Pentasteria* (*Archastropecten*) *lorioli* (de Loriol)

**'*Astropecten*' pichleri von Wöhrmann**

**E 53794** Triassic, Cassian, bed e4. Section VI, Veszprém, Bakony, Hungary. No collection data. Figd Bather, F. A. 1909: 235–236, pl. 13 figs. 435–437 as *Astropecten pichleri* von Wöhrmann.

**'*Astropecten*' sp.**

**E 13573–4** Jurassic, Bathonian. Great Oolite. Bath, Somerset, England. Wright, T. Colln? Figd Wright, T. (1863–1880) 1863: pl. 8 fig. 3 (E 13573), 4 (E 13574) as ossicula of Asteriidae.

**E 13575–7** Jurassic, Bathonian. Great Oolite. Bath, Somerset. Wright, T. Colln? Figd Wright, T. (1863–1880) 1863: pl. 8 fig. 6 (E 13575), 7 (E 13576), 8 (E 13577) as *Astropecten* sp.

***Astropecten wittsi* Wright**

**E 1637** See: *Pentasteria* (*Archastropecten*) *wittsi* (Wright)

## B

***Baliactis devonicus* Spencer**

**E 13628 Holotype.** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 1910. Type figd Spencer, W. K. (1914–1940) 1927: 376, 378, 379, text figs 243, 244, pl. 24 fig. 1 (all referred to as E 13625).

***Baliactis ordovicus* Spencer**

**E 52348 Holotype.** Type species of *Baliactis* Spencer, 1927: 375–376. Upper Ordovician, Caradocian. Habberley Brook, Pontesford, Shropshire, England. Colld Audley, A. Shrewsbury Museum. Exch. November 1956. Figd Spencer, W. K. (1914–1940) 1922: pl. 17 fig. 1; 1927: 376, text fig. 242, 377–378. Type refd Owen, H. G. 1965: 560. Selected by Owen as the type by monotypy. See also his note on p. 560.

## C

***Caletaster* sp**

**E 54083** Cretaceous, Cenomanian. Wilmington Sands, 6.58m below datum. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 202, 203, 207, pl. 42 figs 6a,b.

***Calliderma hamptonensis* (Wright)**

**E 1066 Holotype** of *Goniaster hamptonensis* Wright. Jurassic, Bathonian. Great Oolite, 'planking beds' freestone. Minchinghampton Common, Gloucestershire, England. Colld Day, E., purchd from him by Buckman. Buckman, J. Colln. Type figd Wright, T. (1863–1880) 1863: 109–110, pl. 2 figs 2a,b as *Goniaster hamptonensis* Wright.

***Calliderma latum* Forbes**

**E 3347, E 3348, OR 35504, OR 47001** See: *Calliderma latum* (Forbes)

***Calliderma latum* (Forbes)**

**E 3347** Cretaceous. England. Capron, J. R. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 13, 14, pl. 2 figs 2a–d as *Calliderma latum* Forbes.

**E 3348** (ex. 76002) Cretaceous, Cenomanian, *subglobosus* Zone. Sussex, England. Capron, J. R. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 13, 14, pl. 2 figs 1a–e as *Calliderma latum* Forbes.

**OR 35504 Syntype** of *Goniaster (Astrogonium) latus* Forbes. Cretaceous, Cenomanian, *subglobosus* Zone. Amberley, Sussex, England. Dixon, F. Colln. Type refd Forbes, E. 1848: 474 as *Goniaster (Astrogonium) latus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 333, pl. 23 fig. 4 as *Goniaster (Astrogonium) latus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 367, 370, 440, pl. 23 fig. 4 as *Goniaster (Astrogonium) latus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 12–14, pl. 3 figs 1a–e as *Calliderma latum* Forbes.

**OR 35505** See: *Calliderma smithiae* (Forbes)

**OR 47001** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 13, 14, pl. 3 figs 2a,b as *Calliderma latum* Forbes.

***Calliderma mosaicum* Forbes**

**E 2574, E 2602, E 2620, E 13049** See: *Calliderma smithiae* (Forbes)

**'*Calliderma smithiae*' (Forbes)**

**E 3346** See: *Calliderma smithiae* (Forbes)

***Calliderma smithiae* Forbes**

**OR 48080, OR 75997, E 20973–74** See: *Calliderma smithiae* (Forbes) *Calliderma smithiae* (Forbes)

**E 5063** See: *Ophryaster sulcatus* (Sladen)

***Calliderma smithiae* (Forbes)**

**E 2574** Cretaceous, Cenomanian. Lower Chalk. England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 10, 11, pl. 5 figs 2a–e as *Calliderma mosaicum* Forbes; 1907: 123 as *Calliderma smithiae* (Forbes). Figd Gale, A. S. 1988 (1987a): 159, 170, 171, pl. 1 fig. 1.

**E 2602** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Smith, Mrs M. H. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: pl. 6 fig. 1 as *Calliderma mosaicum* Forbes; 1907: 123 as *Calliderma smithiae* (Forbes).

**E 2620** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Smith, Mrs M. H. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 11, pl. 6 fig. 2a–c as *Calliderma mosaicum* Forbes; 1907: 123 as *Calliderma smithiae* (Forbes).

**E 3346** (ex. 76002) Cretaceous, Cenomanian. Lower Chalk. Dorking, Surrey, England. No collection data. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 5, 10, pl. 7 figs 4a–c as *Calliderma mosaicum* Forbes; 1907: 123 as '*Calliderma smithiae*' (Forbes).

**E 13049** (ex. 76002) Cretaceous, Cenomanian. Lower Chalk. Cowslip Pit, county unknown, England. Purchd Capron, H. 1879. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: pl. 12 figs 4a–d as *Calliderma mosaicum* Forbes. No other information, either in the registers or with



the specimen, indicates the location of Cowslip Pit.

**E 20969–70** Cretaceous, Campanian, *mucronata* Zone, 'L'. Norfolk, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 173, pl. 12 figs 25 upper (E 20969), lower (E 20970).

**E 20973–74** Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 127, 173, pl. 12 figs 22 upper (E 20973), lower (E 20974) as *Calliderma smithiae* Forbes.

**OR 35505** Syntype of *Calliderma latum* (Forbes). Cretaceous, Cenomanian, *subglobosus* Zone. Washington, Sussex, England. Dixon, F. Colln. Type retd Forbes, E. 1848: 474 as *Goniaster (Astrogonium) latus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 333–334, pl. 23 fig. 5 as *Goniaster (Astrogonium) latus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 367, 370, 440, pl. 23 fig. 5 as *Goniaster (Astrogonium) latus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 5, 13, pl. 3 figs 3a,b as *Calliderma latum* (Forbes). Figd Gale, A. S. 1988 (1987a): 161, 170, 171, pl. 2 fig. 2.

**OR 48080** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. No collection data. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 5, 7, 9, pl. 8 figs 2a–e as *Calliderma smithiae* Forbes.

**OR 75997** Holotype of *Goniaster (Astrogonium) smithii* Forbes. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Burham, Kent, England. Smith, Mrs M. H. Colln. Type retd Forbes, E. 1848: 474–475 as *Goniaster (Astrogonium) smithii* Forbes. Figd Forbes, E. in Dixon, F. 1850: 334, pl. 22 figs 1, 2 as *Goniaster (Astrogonium) smithii* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 367, 370, 439, pl. 22 figs 1, 2 as *Goniaster (Astrogonium) smithiae* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 5–9, pl. 1 figs 1a–f as *Calliderma smithiae* Forbes. Figd Gale, A. S. 1988 (1987a): 159, 170, 171, pl. 1 fig. 2 (referred to E 3349).

#### **Chomataster acules Spencer**

**E 13255** Holotype. Type species of *Chomataster* Spencer 1913 : 128–129. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 128–129, 177, pl. 16 figs 8, 9.

**E 13256–59** Paratypes. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 177, pl. 16 figs 10 (E 13256), 11, 11a (E 13257), 12 (E 13258), 13 (E 13259).

**E 13260–61** Paratypes. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 128–129, 173, pl. 12 figs 28 upper (E 13260), lower (E 13261).

**E 13262** Paratype. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 128–129, 173, pl. 12 fig. 3. Fig. 3 is an arm reconstructed from several ossicles.

#### **Chomataster coombii (Forbes)**

**E 13724** See: *Nymphaster coombii* (Forbes)

#### **Chomataster humilis Schulz & Weitschat**

**E 28407a,b** See: *Nymphaster humilis* (Schulz & Weitschat)

#### **Chomataster marginatus (Sladen)**

**OR 35484** See: *Nymphaster marginatus* Sladen

#### **Chomataster praecursor Spencer**

**E 20971–72** Cretaceous, Campanian, *mucronata* Zone, 'M'. Studland, Dorset, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 129, 173, pl. 12 figs 26 upper (E 20971), lower (E 20972).

#### **Cnemidactis girvanensis (Schuchert)**

**E 52383** Holotype of *Urasterella girvanensis* Schuchert. Type species of *Cnemidactis* Spencer, 1918 : 156. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Nicholson, H. A. & Etheridge, R. 1880: 325–326, pl. 21 figs 9, 10 as *Tetraster* sp. Type figd Schuchert, C. 1915: 165, 175, 186, pl. 28 fig. 5 as *Urasterella girvanensis* Schuchert. Type retd Spencer, W. K. (1914–1940) 1918: 156 as *Cnemidactis*. The figuring by Schuchert is of a squeeze made from the actual specimen which is stored in the United States National Museum, numbered 60611.

**E 52397a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 159, text figs 102, 161, pl. 11 fig. 2 (E 52397b).

**E 52444a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 158, pl. 12 fig. 2 (E 52444a); 156, 157, text figs 101, 158, 161, 168, pl. 12 fig. 4 (E 52444b).

**E 52453a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 157, text figs 100, 158, (E 52453a).

**E 52484a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 161, pl. 12 fig. 5 (E 52484b).

**E 52499** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 157, pl. 13 fig. 2.

**E 52589a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 159, pl. 11 fig. 1 (E 52589a).

**E 52590a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 156, 157, 158, 159, pl. 12 fig. 1 (E 52590a); 156, 158, pl. 12 fig. 3 (E 52590b).

**E 52897a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Presd by Misses Gray June 1937. Figd Smith, A. B. in Murray, J. W. (editor) 1985: fig. 7.6.2 (E 52897a).

**E 53835a–c** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan,

Ayrshire, Scotland. Gray, Mrs R. Colln. Figd Gale, A. S. 1987b: 119 figs 7A,C (E 53835a).

### **Cocaster bulbiferus** Spencer

**E 13956 Holotype counterpart.** Type species of *Cocaster* Spencer, 1916 : 75. Silurian. Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchased January 1947. Type figd Spencer, W. K. (1914–1940) 1916: 62, 66, 75–78, text figs 32I, 33, 39, 97; 1919: 179, text fig. 122a, pl. 3 fig. 2. The specimen is the counterpart of the part which is in the Royal Scottish Museum, Edinburgh, number 65/158a (as given by Spencer, pl. 2 fig. 1).

### **Compsaster petaliformis** (Stürtz)

**E 5003 Holotype** of *Jaekelaster petaliformis* Stürtz. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 235–236, pl. 4 figs 13–16 as *Jaekelaster petaliformis* Stürtz.

### **Compsaster spiniger** (Wright)

**E 1642 Holotype** of *Uraster spiniger* Wright. Jurassic. Bathonian. Forest Marble. Near Road, Wiltshire, England. Colld Parsons, H. F., Wright, T. Colln. Purchd Butler, F. H. May 1887. Type figd Wright, T. (1863–1880) 1880: 166–168, text fig. 41 (fig. is reversed), pl. 21 fig. 1 as *Uraster spiniger* Wright. Figd Wright, T. 1886a: 50–52, text fig. on p. 51 as *Uraster spiniger* Wright. The text figure on p. 51 of Wright, 1886a, is reversed.

### **Comptonia comptoni** Forbes

**OR 34311** See: *Comptoniaster comptoni* (Forbes)

### **Comptonia elegans** Gray

**E 2567 Neotype.** Type species of *Comptonia* Gray 1840 : 278. Cretaceous, Albian. Upper Greensand. Blackdown, Devon, England. Bowerbank Colln. Type reld Gray, J. E. 1840: 278. Figd Forbes, E. in Dixon, F. 1850: 336, pl. 22 fig. 9. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 369, 370, 439, pl. 22 fig. 9. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 71–72, pl. 17 figs 4, 4a. The justification for the selection of this specimen as the neotype is given by Spencer on p. 71.

### **Comptoniaster comptoni** (Forbes)

**E 54081** Cretaceous, Cenomanian. Wilmington Sands, 6.71m below datum. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 197, 202, pl. 41 figs 5a,b. **OR 34311** Syntype of *Goniaster (Stellaster) comptoni* Forbes). Cretaceous. Upper Greensand. England. Bowerbank Colln. Type reld Forbes, E. 1848: 476 as *Goniaster (Stellaster) comptoni* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 69, 70, pl. 17 figs 3, 3a–b as *Comptonia comptoni* Forbes.

### **Coulonia colei** (Forbes)

**E 428a–g** Eocene, Ypresian. London Clay, division 5. Highgate, North London, Middlesex, England. Presd Maitland, R. 1st October 1884. Figd Rasmussen, H. W. 1972: 43, pl. 3 fig. 9, pl. 12 fig. 1 (E 428a), pl. 3 figs 10a,b (E 428b), figs 11a,b (E 428c), figs 12 left (E 428d), right (E 428e), 13 left (E 428f), right (E 428g) (under E 428). E 428b–g are individual components of a single arm – E 428a – with suffixes for identification.

**OR 38490** Eocene. London Clay. Sheppey, Kent, England. Griffiths, W. Colln January 1858. Figd Rasmussen, H. W. 1972: 43, pl. 3 fig. 14 (under E 38490).

**OR 57501 Syntype** of *Astropecten crispatus* Forbes. Eocene. London Clay. Isle of Sheppey, Kent, England. Bowerbank Colln. Purchd 1865. Type reld Forbes, E. 1848: 479 as *Astropecten crispatus* Forbes. Figd Forbes E. 1849: 3, fig. 3 as *Astropecten crispatus* Forbes. The specimen has been totally destroyed by pyrite decomposition. According to a note included with the specimen, this occurred perhaps between 1931–1939, but probably started long before, as treatment with paraffin wax had been given in 1919. Figured herein, fig. 3.

**OR 57503 Holotype** of *Astropecten armatus* Forbes. Eocene. London Clay. Isle of Sheppey, Kent, England. Bowerbank Colln. Type reld Forbes, E. 1848: 479 as *Astropecten armatus* Forbes. Figd Forbes E. 1849: 3, fig. 4 as *Astropecten armatus* Forbes. Figd Forbes, E. 1852: 29, pl. 4 figs 1a,b as *Astropecten armatus* Forbes. Fig. 1a in Forbes 1852, is reversed left–right; it is a mirror image.

### **Coulonia** sp

**E 54168** Cretaceous, Lower Cenomanian. Loose, or 11.5m below datum, Bed A1. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 207, 208 pl. 43 fig. 4. The text (p.207) states that E 54168 was found loose, but the plate explanation indicates 11.5m below datum, from Bed A1. The explanation of pl. 43 gives the specimen as fig. 7, but there is no fig. 7 on pl. 43; the correct figure is that labelled 4, centre left on the plate.

### **Crateraster favosus** (Spencer)

**E 13238 Holotype** of *Teichaster favosus* Spencer. Cretaceous, Upper Campanian, *mucronata* Zone. Studland, Dorset, England. Faber Colln. Exch Mineralogy Museum, University of Copenhagen 7th October 1912. Type figd Spencer, W. K. 1913: 122–123, pl. 12 fig. 14 as *Teichaster favosus* Spencer. Locality information given by Spencer on p. 173 is 'Isle of Wight'. Elsewhere – on p. 122, on labels and in the register – the locality given is Studland, Dorset.

**E 13297–301 Paratypes** of *Teichaster favosus* Spencer. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: E 13297–8: 122, 173, pl. 12 figs 16 (E 13297 = upper, E 13298 = lower); 177, pl. 16 figs 14 (E 13299), 15 (E 13300), 16a,b (E 13301) as *Teichaster favosus* Spencer.

**E 20280** Cretaceous, Campanian, *mucronata* Zone. Clarendon, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Gale, A. S. 1988 (1987a): 181, 183, pl. 7 fig. 11.

### **Crateraster quinqueloba** (Goldfuss)

**E 2036** Cretaceous. Upper Chalk. Kent, England. Purchd Harford, F. June 1888. Figd Gale, A. S. 1988 (1987a): 172, 177, pl. 5 fig. 17.

**E 2582 Paratype** of *Pentagonaster megaloplax* Sladen. Cretaceous, Senonian. Upper Chalk. South-east England. England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 28, pl. 4 figs 3a–c as *Pentagonaster megaloplax* Sladen; 1907: 108 as *Pentagonaster quinqueloba* (Goldfuss).

**E 5064** (ex. 46782) **Paratype** of *Pentagonaster megaloplax*



Sladen. Cretaceous, Senonian. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Purchd 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 28, 29, pl. 4 figs 4a–e as *Pentagonaster megaloplax* Sladen; 1907: 108 as *Pentagonaster quinqueloba* (Goldfuss).

**E 5065** (ex. 35500) **Holotype** of *Pentagonaster megaloplax* Sladen. Cretaceous, Senonian. Upper Chalk. Sussex, England. Dixon, F. Colln. Figd Forbes, E. in Dixon, F. 1850: 333, pl. 23 fig. 9 as *Goniaster (Astrogonium) lunatus* Woodward. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 366, 370, 440, pl. 23 fig. 9 as *Goniaster (Astrogonium) lunatus* Woodward. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 27–29, pl. 4 figs 2a–c as *Pentagonaster megaloplax* Sladen; 1907: 108 as *Pentagonaster quinqueloba* (Goldfuss).

**E 20279** Cretaceous, Santonian, *coranguinum* Zone. Micheldever, Hampshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Wright, C. W. & Smith, A. B. 1987: 216, pl. 47 fig. 4. Figd Gale, A. S. 1988 (1987a): 177, 179, pl. 6 fig. 7.

**E 20968** Cretaceous, Campanian, *mucronata* Zone. Studland, Dorset, or Isle of Wight, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 121, 173, pl. 12 fig. 13. On a label with the specimen, E. R. Bush (once an Experimental Officer curator in the Department of Palaeontology) wrote ' . . . According to W. K. Spencer's small card label, the locality for this specimen is Studland, but in the Explanation of Plate 12 figures ( . . . p.173) it is given as Isle of Wight.' The label is dated 6/12/51.

**E 20975–76** Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 121, 173, pl. 12 figs 1 upper, 2 upper, 3 (E 20975); 1 lower, 2 lower, 4 (E 20976).

**OR 46779** Cretaceous, Senonian. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. 10th May 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 30, pl. 13 figs 1a,b as *Pentagonaster megaloplax* Sladen; 1907: 108 as *Pentagonaster quinqueloba* (Goldfuss).

## D

### *Devonistella filiciformis* (Woodward)

**E 13638** **Syntype** of *Helianthaster filiciformis* Woodward. **Paralectotype**. Devonian. Great Inglebourne, Harberton, South Devon, England. Champenowne, A. Colln. Purchd July 1909. Type figd Woodward, H. 1874: 7–10, fig. on p. 8 as *Helianthaster filiciformis* Woodward. Figd Spencer, W. K. (1914–1940) 1927: 369, 370; 1930: pl. 25 fig. 3 (in error as E 13639a).

**E 13639** **Syntype** of *Helianthaster filiciformis* Woodward. **Lectotype**. Type species of *Devonistella* Spencer, 1927: 369. Devonian. Great Inglebourne, Harberton, South Devon, England. Champenowne, A. Colln. Purchd July 1909. Type refd Woodward, H. 1874: 7–10 as *Helianthaster filiciformis* Woodward. Figd Spencer, W. K. (1914–1940) 1927: 369, 370 text fig. 236; 1930: pl. 25 figs 1, 2 (in error numbered E 13639b).

## E

### *Echinasterella sladeni* Stürtz

**E 3468** **Syntype**. Type species of *Echinasterella* Stürtz, 1890: 225. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 225, pl. 28 figs 26, 26a,b.

**E 3489** **Syntype**. Type species of *Echinasterella* Stürtz, 1890: 225. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 225, pl. 28 fig. 27.

### *Echinasterias spinosus* Stürtz

**E 5000, E 5001** See: *Palaeosolaster gregoryi* Stürtz

### *Echinodiscus multidactylus* Stürtz

**E 4998, E 4999** See: *Palaeosolaster gregoryi* Stürtz

### *Echinostella traquairi* Stürtz

**E 4997** See: *Palaeosolaster gregoryi* Stürtz

### *Eoactis simplex* Spencer

**E 13154** **Holotype**. Type species of *Eoactis* Spencer, 1914: 205. Silurian. Lower Ludlow, or Wenlock. Hafod, Llandoverly, Dyfed, Wales. Morton, G. H. Colln. Purchd from Miss Morton July 1900. Type figd Spencer, W. K. (1914–1940) 1914: 30, pl. 1 fig. 4; 1922: 205–208, text figs 147, 148, pl.15 fig. 8.

## G

### *Gasterometra polycirra* Gislén

**E 7401** See: *Stauranderaster* sp.

### *Girvanaster sculptus* Spencer

**E 52539** **Syntype**. Type species. Lectotype of *Protopalaeaster sculptus* (Spencer). Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colln Gray, Mrs R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1916: 61, 70, text figs 35, 72, pl.3 fig. 6. Type refd Owen, H. G. 1965: 568 as *Protopalaeaster sculptus* (Spencer). Selected by Owen as lectotype of species.

### *Goniaster (Astrogonium) coombii* Forbes

**OR 35503** See: *Nymphaster coombii* (Forbes)

### *Goniaster (Astrogonium) latus* Forbes

**OR 35504, OR 35505** See: *Calliderma latum* (Forbes)

### *Goniaster (Astrogonium) lunatus* Woodward

**E 5065** See: *Crateraster quinqueloba* (Goldfuss)

### *Goniaster (Astrogonium) smithiae* Forbes

**OR 75997** See: *Calliderma smithiae* (Forbes)

### *Goniaster (Astrogonium) smithii* Forbes

**OR 75997** See: *Calliderma smithiae* (Forbes)

### *Goniaster (Goniodiscus) bowerbankii* Forbes

**E 2578** See: *Metopaster bowerbankii* (Forbes)

### *Goniaster (Goniodiscus) mantelli* Forbes

**OR 76002, E 2570** See: *Metopaster mantelli* (Forbes)

### *Goniaster (Goniodiscus) parkinsoni* Forbes

**E 2569** See: *Metopaster parkinsoni* (Forbes)

**Goniaster (Goniodiscus) rugatus Forbes**  
E 2585 See: *Metopaster rugatus* (Forbes)

**Goniaster (Goniodiscus) uncatus Forbes**  
E 2577 See: *Metopaster parkinsoni* (Forbes)  
OR 57518 See: *Metopaster rugatus* (Forbes)

**Goniaster hamptonensis Wright**  
E 1066 See: *Calliderma hamptonensis* (Wright)

**Goniaster mantelli Forbes**  
OR 76002, E 2570 See: *Metopaster mantelli* (Forbes)

**Goniaster rugatus Forbes**  
E 2585 See: *Metopaster rugatus* (Forbes)

'... fragment of *Goniaster* sp. ...'  
E 2568 See: *Stauranderaster* sp.

**Goniaster (Stellaster) comptoni Forbes**  
OR 34311 See: *Comptoniaster comptoni* (Forbes)

**Goniaster stokesii Forbes**  
E 52239, 44 See: *Teichaster stokesii* (Forbes)

**Goniaster uncatus Forbes**  
OR 57518 See: *Metopaster rugatus* (Forbes)

**Goniasteridae sp. A**  
E 54112 Cretaceous, Cenomanian. Grizzle, 2.66 m below datum. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 205, 207, pl. 43 figs 2a-c.

E 54358 (ex. 21029)(ex. Wright & Wright coll. No. 21029) Cretaceous, Cenomanian. Pit 2, Wilmington, Devon, England. C. W. & E. V. Wright Colln. Presd March 1977. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 205, 207, pl. 43 figs 1a-c.

**Goniasteridae sp. B**  
E 54115 Cretaceous, Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 205, 207, pl. 43 figs 5a,b.

## H

**Hadranderaster abbreviatus (Spencer)**  
OR 57538 **Holotype** of *Pentaceros abbreviatus* Spencer. **Type species** of *Hadranderaster* Spencer 1907: 125. Cretaceous. Upper Chalk. Charlton, Kent, England. Tennant, J. Colln. Purchd 16th November 1870. Type figd Sladen, W. P. & Spencer, W. K. (1891-1908) 1905: 86-87, pl. 24 figs 1, 1a-c as *Pentaceros abbreviatus* Spencer; 1907: 125 referred to as *Hadranderaster abbreviatus* (Spencer).

**Helianthaster filiciformis Woodward**  
E 13638, E 13639 See: *Devonistella filiciformis* (Woodward)

**Helianthaster rhenanus Roemer**  
E 3361 Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 218-219, pl. 26 figs 14a, 15 (fig. 15 is schematic with E 3362 and E 3363). Figd Spencer, W. K. (1914-1940) 1927: 372, 373, text fig. 237; 1930: 389, 390, 391, 392, text figs 249, 250.

E 3362 Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 218-219, pl.

26 fig. 15 (fig. 15 is schematic with E 3361 and E 3363). Figd Spencer, W. K. (1914-1940) 1927: 373, 374, text fig. 240; 1930: 390.

E 3363 Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 218-219, pl. 26 fig. 15 (fig. 15 is schematic with E 3361 and E 3362), pl. 27 fig. 14.

E 3513 Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd 1894. Figd Stürtz, B. 1893: 12-13, pl. 1 fig. 4. Figd Spencer, W. K. (1914-1940) 1927: 372, 373, 387, text fig. 239, pl. 24 fig. 9 (as E 3368); 1930: 390.

E 52860 Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, Rhineland, Germany. Stürtz, B. then Spencer, W. K. Colln. Presd Egerton, Mrs H. October 1955. Figd Spencer, W. K. (1914-1940) 1927: 372, 373; 1930: 390, 391, 392, text figs 238, 251.

**Hippasteria tuberculata (Forbes)**

E 52242 (ex. 57502) Eocene. London Clay. Isle of Sheppey, Kent, England. Bowerbank Colln 1850. Figd Rasmussen, H. W. 1972: 49, pl. 4 figs 5a,b.

E 53295 Eocene. London Clay. Foreshore, near Warden Point, Isle of Sheppey, Kent, England. Cold Sancto, R. G. Presd September 1963. Figd Rasmussen, H. W. 1972: 49, pl. 4 figs 2a,b.

OR 33832a,b Eocene. London Clay. Isle of Sheppey, Kent, England. Griffiths, W. Colln November 1854. Figd Rasmussen, H. W. 1972: 49, pl. 4 figs 3a,b (33832a), 4a-c (33832b) (both with 'E' prefix).

## J

**Jaekelaster petaliformis Stürtz**

E 5003 See: *Compsaster petaliformis* (Stürtz)

## L

**Lepidactis wenlocki Spencer**

OR 57476 **Holotype**. **Type species** of *Lepidactis* Spencer, 1918: 113. Silurian. Wenlock Limestone. Dudley, Worcestershire, England. Allport, Samuel Colln. Purchd 1871. Type figd Spencer, W. K. (1914-1940) 1918: 113-116, text figs 68-70, pl. 6 fig. 5.

**Lepidaster grayi Forbes**

OR 40215 **Holotype**. **Type species** of *Lepidaster* Forbes, 1850: 1-2. Silurian. Wenlock Limestone. Quarries at Castle Hill, Dudley, Worcestershire, England. Gray, John Colln. Type figd Forbes, E. 1850a: 1-2, pl. 1 figs 1-3.

**Linckia sp.**

E 5055 (ex. 76002) Cretaceous. Lower Chalk. No locality data. Purchd Capron, J. R. 1879. Figd Sladen, W. P. & Spencer, W. K. (1891-1908) 1907: 100-101, pl. 27 figs 1, 1a.

**Lophidiaster concavus Rasmussen**

E 53630-31, 33-34 Eocene, Ypresian. London Clay, division 3. Wraybury Reservoir, Poyle, Buckinghamshire, England. Cold Rundle, A. J. & Cooper, J. Presd. Type figd Rasmussen, H. W. 1972: pl. 3 figs 20 (E 53630), 21 (E 53631), 23 (E 53633), 24 (E 53634).

E 53632 **Holotype**. Eocene, Ypresian. London Clay, division 5. Wraybury Reservoir, Poyle, Buckinghamshire, England. Cold Rundle, A. J. & Cooper, J. Presd. Type figd



Rasmussen, H. W. 1972: 47–48, pl. 3 figs 22a,b.

**E 53675** Eocene, Ypresian. London Clay, division 2. Avey, Essex, England. Rundle, A. J. Colln. Type figd Rasmussen, H. W. 1972: pl. 3 fig. 25.

### **Lophidiaster pygmaeus** Spencer

**E 13263–4** **Syntypes.** Cretaceous, Upper Senonian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 139, 172, pl. 11 figs 20 upper (E 13263), lower (E 13264).

## M

### **Mastaster** sp.

**E 54109** Cretaceous, Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 204, 207, pl. 43 figs 4a,b.

### **Mastaster villersensis** Mercier

**E 54096** Cretaceous, Cenomanian. Wilmington sands, 4.56m–9.4m below datum. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 203, 204, 207, pl. 43 figs 3a,b.

**E 54106,7** Cretaceous, Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 200, 203, 204, pl. 42 figs 5a,b (E 54107), 7a,b (E 54107).

**E 54169** Cretaceous, Lower Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 200, 204, pl. 42 figs 6a,b.

**E 54370,1** (ex. Wright & Wright colln no. 2009, 2120) Cretaceous, Cenomanian. Hooken, Devon, England. Wright, C. W. & E. V. Colln. Presd March 1977. Figd Wright, C. W. & Wright, E. V. 1940: pl. 15 figs 2 left (E 54370), 2 right (E 54371). Figd Breton, G. 1979: 42, text fig. 24 (pars.).

**E 54372** (ex. Wright & Wright colln no. 10414) Cretaceous, Cenomanian. sandy facies. Hooken, Devon, England. Wright, C. W. & E. V. Colln. Presd March 1977. Figd Wright, C. W. & Wright, E. V. 1940: 247, pl. 14 figs 14, 15, pl. 15 fig. 7.

**E 54373** (ex. Wright & Wright colln no. 10414) Cretaceous, Cenomanian. Pit 2 Wilmington, Devon, England. Wright, C. W. & E. V. Colln. Presd March 1977. Figd Wright, C. W. & Wright, E. V. 1940: pl. 15 fig. 1.

**E 54374** (ex. Wright & Wright colln no. 3535) Cretaceous, Cenomanian. Pit 2 Wilmington, Devon, England. Wright, C. W. & E. V. Colln. Presd March 1977. Figd Wright, C. W. & Wright, E. V. 1940: pl. 15 fig. 4. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 200, 203, pl. 42 fig. 3.

### **Mesopalaeaster complicatus** Spencer

**E 52445Aa,b,Ba,b** **Holotype.** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) E

52445Aa,b; 1916: 86–89, text figs 46, 47, 48; 1922: 226 ; E 52445Ba,b; 1916: 86–89, text fig. 47, pl.3 fig. 5; 1919: 179; 1922: 226. Figd Gale, A. S. 1987b: fig. 7G (E 52445Ab). The holotype is specimen E 52445Aa,b.

**E 52504** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1916: 86–89, text fig. 46; 1919: 179; 1922: 226, pl. 2 fig. 9.

### **Mesopalaeaster primus** Spencer

**E 52441a,b** **Syntype. Lectotype.** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) E 52441a; 1916: 84–87, text fig. 44; 1919: 179, pl. 2 fig. 2; E52441b; 1916: 80, 84–87, text fig. 45; 1919: 179, pl. 3 fig. 8. Type reld Owen, H. G. 1965: 568. Selected by Owen as the Lectotype.

**E 52542** **Syntype. Paralectotype.** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs R. Purchd 1920. Type reld Spencer, W. K. (1914–1940) 1916: 84–87.

### **Mesopalaeaster(?) leintwardinensis** Spencer

**E 13153** See: *Arisaigaster leintwardinensis* (Spencer)

### **Metopaster** A

**E 54367** See: *Metopaster* sp. A

### **Metopaster albocervus** Gale

**E 54287** **Paratype.** Cretaceous, Cenomanian. probably Wilmington Sands. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. November 1988. Figd Gale, A. S. 1986: 21, pl. 9 fig. 15.

**E 54288** **Holotype.** Cretaceous, Cenomanian. probably Wilmington Sands. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. November 1988. Type figd Gale, A. S. 1986: 21, pl. 9 figs 16A–C.

### **Metopaster andraea** Gale

**E 54289** **Holotype.** Cretaceous, Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. 1987. Type figd Gale, A. S. 1986: 22, pl. 9 figs 17A,B.

**E 54290** **Paratype.** Cretaceous, Cenomanian. The White Hart Sand Pit, Wilmington, Devon, England. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 22, pl. 9 figs 18A,B.

### **Metopaster bowerbankii** Forbes

**E 2578** See: *Metopaster bowerbankii* (Forbes)

### **Metopaster bowerbankii** (Forbes)

**E 2578** **Holotype** of *Goniaster* (*Goniodiscus*) *bowerbankii* Forbes. Cretaceous. Chalk. Kent, England. Bowerbank Colln. Type reld Forbes, E. 1848: 473 as *Goniaster* (*Goniodiscus*) *bowerbankii* Forbes. Figd Forbes, E. in Dixon, F. 1850: 333, pl. 22 fig. 4 as *Goniaster* (*Goniodiscus*) *bowerbankii* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 366, 370, 439, pl. 22 fig. 4 as *Goniaster* (*Goniodiscus*) *bowerbankii* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 42, 43, 45, pl. 16 figs 1a–c as *Metopaster bowerbankii* Forbes.

### **Metopaster bromleyi** Gale

**E 13304** **Syntype** of *Metopaster parkinsoni* (Forbes) var. *calcar* Spencer. **Holotype.** Cretaceous, uppermost Lower

Campanian. Trümmerkreide. Balsberg, North-east Skania, Sweden. Presd University of Lund. Type figd Spencer, W. K. 1913: 119–120, 176, pl. 15 fig. 13 as *Metopaster parkinsoni* (Forbes) var. *calcar* Spencer. Type reld Gale, A. S. 1986: 22, 24.

**E 54192–4 Paratypes.** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 2 figs 14A,B (E 54192), 15A,B (E 54193), 16A,B (E 54194).

**E 54341–6 Paratypes.** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 3 figs 1A,B (E 54341), 2A,B (E 54342), 3 left (E 54343), 3 right (E 54344), 4A,b (E 54345), 5 (E 54346).

#### **Metopaster calcar Spencer**

**E 13305 Syntype** of *Metopaster parkinsoni* (Forbes) var. *calcar* Spencer. **Lectotype.** Cretaceous, uppermost Lower Campanian. Trümmerkreide. Balsberg, North-east Skania, Sweden. Presd University of Lund. Type figd Spencer, W. K. 1913: 119–120, 176, pl. 15 figs 14–16 as *Metopaster parkinsoni* (Forbes) var. *calcar* Spencer. Type reld Gale, A. S. 1986: 24–25. Selected by Gale as the lectotype.

**E 54245–67** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 24, pl. 8 figs 12A,B (E 54245), 13 (E 54246), 14A,B (E 54247), 15A,B (E 54248), 16A,B (E 54249), 17 (E 54250–63 in a group), 18 (E 54264), 19 (E 54265), 20 (E 54266), 21 (E 54267).

**E 54270** Cretaceous, Santonian. Conglomerate horizon. Ringeleslätte, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 8 fig. 22.

#### **Metopaster chilipora (Desmoulins)**

**E 34340** Cretaceous, Upper Campanian. Road cutting on the Autoroute de Charente, Gironde, Aquitaine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 4 figs. 3A,B (not 2B as in plate explanation).

**E 54218** Cretaceous, Upper Campanian. Talmont, near Royan, Charente, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 4 figs 1A,B.

**E 54220** Cretaceous, Upper Campanian. Road cutting on the Autoroute de Charente, Gironde, Aquitaine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 4 figs. 2A,B.

#### **Metopaster cingulatus Sladen**

**OR 46776b Holotype.** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. 27th July 1869. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 53–55, pl. 14 figs 4a–d. The specimen was referred to by Sladen as bearing the registraton number 46776. This number is also carried by a specimen of *Metopaster uncatus* (Forbes), so the distinction is made by the suffixes a and b.

#### **Metopaster cornutus Sladen**

**E 20723** Cretaceous, Turonian, *cuvieri* Zone. (with flints). Branscombe, South Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: pl. 29 fig. 12.

#### **Metopaster decipiens Spencer**

**E 20306 Holotype.** Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Type figd Spencer, W. K. 1913: 118, 171,

pl. 10 fig. 18. Figd Gale, A. S. 1986: 26–27, pl. 4 fig. 13.

#### **Metopaster elegans Gale**

**E 54273, 75–6 Paratypes.** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 28–29, pl. 8 figs 24A,B (E 54273); pl. 9 figs 2A,B (E 54275), 3A,B (E 54276).

**E 54274 Holotype.** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Type figd Gale, A. S. 1986: 28–29, pl. 9 figs 1A,B.

#### **Metopaster exsculptus Spencer**

**E 13021** (ex. E 2625) Cretaceous. Upper Chalk. England. Dixon, F. Colln. Figd Schulz, M.-G. & Weitschat, W. 1975: pl. 28 fig. 3 (referred to number 13021).

#### **Metopaster hunteri (Forbes)**

**E 2583** Cretaceous. Upper Chalk. England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 60, 61, 62, pl. 12 figs 3a–e as *Mitraster hunteri* Forbes.

**E 13058** Cretaceous. Upper Chalk. England. Hudson, R. Colln. Presd July 1907. Figd Gale, A. S. 1986: pl. 7 fig. 5.

**E 13084** (ex. 46772) Cretaceous, Senonian. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 62, 67, pl. 9 figs 3a–e as *Mitraster hunteri* Forbes.

**E 13279** Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 117, 172, pl. 11 fig. 2 as *Mitraster hunteri* Forbes.

**E 20961–2** Cretaceous, Campanian, *mucronata* Zone. Isle of Wight, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 117, pl. 11 fig. 1 as *Mitraster hunteri* Forbes.

**E 54225** Cretaceous, Santonian. basal lag of Phosphatic Chalk. Beauval, near Doullens, Somme, France. Gale, A. S. Colln. Presd 1987. Figd Gale, A. S. 1986: 30, pl. 7 figs 6A,B.

**E 54226** Cretaceous, Lower Campanian. Phosphatic Chalk. Hallencourt pit, near Abbeville, Somme, France. Gale, A. S. Colln. Presd 1987. Figd Gale, A. S. 1986: 30, pl. 7 fig. 7.

**E 54227** Cretaceous, Coniacian, 'pre-*coranguinum* Zone'. hardground. Hope Gap, north of Dieppe, France. Gale, A. S. Colln. Presd 1987. Figd Gale, A. S. 1986: 30, pl. 7 figs 8A,B.

**OR 40274** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: pl. 15 figs 5a–b as *Mitraster hunteri* Forbes.

**OR 40405** Cretaceous. Upper Chalk. Kent, England. Simmons, J. Colln. Figd Gale, A. S. 1986: pl. 17 fig. 1.

**OR 46764** Cretaceous. Upper Chalk. Kent, England. Purchd Wood, J. 1868. Figd Gale, A. S. 1986: 30, pl. 7 fig. 4.

**OR 46766a** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. January 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 59, 61, 66, pl. 15 figs 3a–b as *Mitraster hunteri* Forbes. The specimen was referred to by Sladen as bearing the number 46766. This number is also carried by specimen of *Metopaster hunteri* (Forbes), so the distinction is made by suffixes a and b.

**OR 46766b** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. January 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 59, 61, pl. 15 figs 4a–d as *Mitraster hunteri* Forbes. The specimen was referred to by Sladen as bearing the number 46766. This



number is also carried by another specimen of *Metopaster hunteri* (Forbes), so the distinction is made by suffixes a and b.

**OR 46781** Cretaceous. Upper Chalk. Kent, England. Purchd Simmons, J. January 1870. Figd Gale, A. S. 1986: pl. 7 fig. 2.

**OR 75539** Cretaceous. Upper Chalk. Bromley, Kent, England. Purchd Simmons, J. February 1864. Figd Gale, A. S. 1986: pl. 7 fig. 3.

#### **Metopaster loirensis Gale**

**E 54207, 9–14** **Paratypes.** Cretaceous, Santonian. Château Member, Craie de Villedieu, above glauconitized hardgrounds. Small roadside quarry between Villedieu and Le Trehet, Touraine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 31–32, pl. 3 figs 10 (E 54207), 12A,B (E 54208), 13 (E 54210), 14 (E 54211), 15 (E 54212), 16A,B (E 54213), 17 (E 54214). See remarks for E 54208.

**E 54208** **Holotype.** Cretaceous, Santonian. Château Member, Craie de Villedieu, above glauconitized hardgrounds. Small roadside quarry between Villedieu and Le Trehet, Touraine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 31–32, pl. 3 figs 11A,B (referred to on p. 31 as E 54207, and in plate explanation as E 54208). Gale referred to E 54207 as the holotype on p. 31, but in the plate explanation he referred to E 54208 as the holotype. E 54208 is in fact the holotype because he referred to it as ‘... a large ultimate superomarginal ossicle ...’ on p. 31 and also in the plate explanation. E 54207 is referred to, in the plate explanation only, as ‘... ultimate superomarginal ...’.

**E 54216** Cretaceous, Santonian. Craie de Villedieu, Calcarenes à bryozoaires de la Bouchardière. Villedieu Le Château, Touraine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 3 figs 18A,B.

#### **Metopaster mantelli Forbes**

**OR 40177, OR 76002, E 2570** See: *Metopaster mantelli* (Forbes)

#### **Metopaster mantelli (Forbes)**

**E 2570** Cretaceous. Upper Chalk. No locality data. Bowerbank Colln. Figd Forbes, E. in Dixon, F. 1850: 332, pl. 23 fig. 11 as *Goniaster mantelli* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 366, 370, 440, pl. 23 fig. 11 as *Goniaster (Goniodiscus) mantelli* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 40, 41, pl. 13 figs 3a–b as *Metopaster mantelli* Forbes.

**OR 40177** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 39, 40, 41, pl. 13 figs 2a–d as *Metopaster mantelli* Forbes.

**OR 76002** Cretaceous. Upper Chalk. Gravesend, Kent, England. Bowerbank Colln. Figd Forbes, E. in Dixon, F. 1850: 332, pl. 23 fig. 12 as *Goniaster mantelli* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 366, 370, 440, pl. 23 fig. 12 as *Goniaster (Goniodiscus) mantelli* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 40, 41, pl. 13 figs 4a–b as *Metopaster mantelli* Forbes.

#### **Metopaster parkinsoni Forbes**

**OR 40239, OR 40401, OR 46768, OR 46769, OR 46795, OR 46796, E 2034** See: *Metopaster parkinsoni* (Forbes)

**OR 51413** See: *Metopaster uncatus* (Forbes)

#### **Metopaster parkinsoni Forbes**

**OR 57528** See: *Metopaster uncatus* (Forbes)

#### **Metopaster parkinsoni (Forbes)**

**E 2034** Cretaceous. Upper Chalk. Charlton, Kent, England. Purchd Harford, F. June 1888. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 33, 120, pl. 16 figs 2a–b as *Metopaster parkinsoni* Forbes.

**E 2569** **Lectotype.** Type species of *Metopaster* Sladen 1893: 30. Cretaceous, (probably Santonian, high *corangium* Zone, according to Gale). Upper Chalk. Possibly Sussex, Southern England. Dixon, F. Colln. Figd Forbes, E. in Dixon, F. 1850: 331, pl. 21 fig. 8 as *Goniaster (Goniodiscus) parkinsoni* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 365, 370, 439, pl. 21 fig. 8 as *Goniaster (Goniodiscus) parkinsoni* Forbes. Refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 30, as the type description of *Metopaster*. Type figd Gale, A. S. 1986: 18, pl. 1 fig. 6. Specimen chosen by Gale as lectotype.

**E 2577** Cretaceous. Upper Chalk. No locality data. Dixon, F. Colln. Figd Forbes, E. in Dixon, F. 1850: 331, pl. 21 fig. 8 as *Goniaster (Goniodiscus) uncatus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 365, 370, 439, pl. 21 fig. 8 as *Goniaster (Goniodiscus) uncatus* Forbes.

**E 13729** Cretaceous, Turonian, *Terebraulina* Zone. Tingey's Pit, Wouldham, Kent, England. Dibley, G. E. Colln October 1922. Figd Gale, A. S. 1986: pl. 1 fig. 4.

**E 20425** Cretaceous, Campanian, *pillula* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Spencer, W. K. 1913: 171, pl. 10 fig. 6.

**E 53685** Cretaceous, probably Lower Campanian. Southern England. Beckles Colln. Figd Gale, A. S. 1986: pl. 2 figs 6a–c.

**E 54190** Cretaceous, Middle Cenomanian. bed 10 of the Lower Chalk. West of Dover, Kent, England. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 1 fig. 2.

**E 54191** Cretaceous, Middle Cenomanian. bed 10 of the Lower Chalk. West of Dover, Kent, England. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 1 fig. 3.

**OR 40239** Cretaceous. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 34, 36, pl. 10 fig. 1 as *Metopaster parkinsoni* Forbes.

**OR 40401** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 36, pl. 11 figs 1a–c as *Metopaster parkinsoni* Forbes.

**OR 46768** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. May 1868. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: pl. 10 figs. 3a–c as *Metopaster parkinsoni* Forbes.

**OR 46769** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. June 1868. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 34, 35, 36, pl. 10 figs. 2a–d as *Metopaster parkinsoni* Forbes.

**OR 46795** Cretaceous. Upper Chalk. Bromley, Kent, England. Purchd Simmons, J. April 1870. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: pl. 9 figs. 2a–c as *Metopaster parkinsoni* Forbes.

**OR 46796** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. May 1868. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 36, 37, pl. 12 figs. 1a–e as *Metopaster parkinsoni* Forbes.

**OR 48079** Cretaceous. Upper Chalk. Kent, England. Dixon, F. Colln. Figd Smith, A. B. in Murray, J. W. (editor) 1985: 181, pl. 7.6.3.

**OR 79521** Cretaceous, Cenomanian. Lower Chalk. Kent, England. Presd Marsham, R. Figd Gale, A. S. 1986: 20, pl. 1 fig. 1.

**Metopaster cf parkinsoni (Forbes)**

**E 54202–5** Cretaceous, Coniacian. lower part of Craie de Villedieu, Calcaires durs de la Ribochère. Villedieu Le Château, Touraine, France. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 3 figs 6 (E 54202), 7 (E 54203), 8 (E 54204), 9 (E 54205).

**Metopaster parkinsoni (Forbes) var. calcar Spencer**

**E 13304** See: *Metopaster bromleyi* Gale

**E 13305** See: *Metopaster calcar* Spencer

**Metopaster quadratus Spencer**

**E 20264, E 20265** See: *Metopaster uncatus* (Forbes)

**Metopaster rugatus (Forbes)**

**E 2584** Cretaceous. Upper Chalk. England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 64, pl. 16 fig. 4 as *Mitraster rugatus* Forbes.

**E 2585** Syntype of *Goniaster (Goniodiscus) rugatus* Forbes. Cretaceous, Senonian. Upper Chalk. Southeast England. Dixon, F. Colln. Type refigd Forbes, E. 1848: 471 as *Goniaster (Goniodiscus) rugatus* Forbes. Figd Forbes, E. in Dixon, F. 1850: pl. 32 fig. 15 as *Goniaster rugatus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 440, pl. 23 fig. 15 as *Goniaster (Goniodiscus) rugatus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 64, 66, pl. 16 figs 5a–d as *Mitraster rugatus* Forbes.

**E 13079** (ex. 76002) Cretaceous. Upper Chalk. Gravesend, Kent, England. Purchd Capron, J. R. 1879. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 66, pl. 16 figs 3a–b as *Mitraster rugatus* Forbes.

**OR 57518** Cretaceous. Upper Chalk. Kent, England. Presd Tennant October 1868. Figd Forbes, E. in Dixon, F. 1850: pl. 23 fig. 14 as *Goniaster uncatus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 440, pl. 23 fig. 14 as *Goniaster (Goniodiscus) uncatus* Forbes.

**Metopaster rugissimus Gale**

**E 54228** **Holotype.** Cretaceous, uppermost Lower Campanian. bioclastic gravels. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Type figd Gale, A. S. 1986: 34–35, pl. 7 fig. 19.

**E 54229–34,36** **Paratypes.** Cretaceous, uppermost Lower Campanian. bioclastic gravels. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 34, 35, pl. 7 figs 20A,B (E 54229), 21 (E 54230), 22 (E 54231), pl. 8 figs 1 (E 54232), 2 (E 54233), 3A,B (E 54234), 5 (E 54236).

**E 54297** **Paratype.** Cretaceous, uppermost Lower Campanian. bioclastic gravels. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 8 fig. 4 (as E 54246). The registration number E 54246 is duplicated in pl. 8 figs 4 and 13. In order to avoid confusion, the specimen of pl. 8 fig. 4 has been re-registered as E 54297.

**'Metopaster' sharpii (Wright)**

**OR 75792** **Holotype** of *Stellaster sharpii* Wright. Jurassic. Inferor Oolite, Durston Ironstone. Near Northampton, Northamptonshire, England. Colld Sharp, S. Acquired February 1875. Type figd Wright, T. (1863–1880) 1880: 165, pl. 20 as *Stellaster sharpii* Wright.

**Metopaster sp.**

**E 54272** Cretaceous, uppermost Lower Campanian. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 8 fig. 23.

**E 54367** See: *Metopaster* sp. A

**Metopaster sp. A**

**E 54367** (ex. Wright & Wright colln No. 16571) Cretaceous, Cenomanian. Pit 1, Wilmington, Devon, England. Wright, C. W. & Wright, E. V. Colln. Presd March 1977. Figd Wright, C. W. & Wright, E. V. 1940: 238, text figs 9a–c as *Metopaster* sp. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 198, 200, pl. 42 figs 2a,b as *Metopaster* A.

**Metopaster spenceri Nielsen**

**E 54223** Palaeocene, Lower Danian. North of Højerup, Stevn's Klint, Denmark. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: pl. 4 figs 4A,B.

**Metopaster tamarae Gale**

**E 54238** **Holotype.** Cretaceous, uppermost Lower Campanian. bioclastic gravels. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Type figd Gale, A. S. 1986: 36, pl. 8 fig. 6.

**E 54239–43** **Paratypes.** Cretaceous, uppermost Lower Campanian. bioclastic gravels. Ivö Klack, Skania, Sweden. Presd Gale, A. S. 1987. Figd Gale, A. S. 1986: 36, pl. 8 figs 7A,B (E 54239), 8 (E 54240), 9 (E 54241), 10 (E 54242), 11A,B (E 54243).

**Metopaster thoracifer Geinitz**

**E 20955–8** Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 110, 171, pl. 10 figs 2 left (E 20955), right (E 20956), pl. 10 figs 3 left (E 20957), right (E 20958).

**E 20959–60** Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 171, pl. 10 figs 12 left (E 20959), right (E 20960).

**Metopaster tumidus Spencer**

**E 13265** **Paratypes.** Cretaceous, Upper Campanian, upper *muconata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 113, 175, pl. 14 fig. 1. Spencer wrote that the specimen was reconstructed from '... ossicles washed out ...' of a Chalk sample. The reconstruction as figured by him has subsequently been dismantled, and the ossicles are now retained loose.

**E 13266** **Holotype.** Cretaceous, Upper Campanian, upper *muconata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 113–114, 176, pl. 15 fig. 1.

**E 13267–8,70–72** **Paratypes.** Cretaceous, Upper Campanian, upper *muconata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 113?; 171, pl. 10 fig. 8 (E 13272), 176, pl. 15 figs 2 (E 13271), 3 (E 13267), 4,6, (E 13268), 7 (E 13270).

**E 13269** **Paratype.** Cretaceous, Upper Campanian, upper *muconata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 113?, 176, pl. 15 fig. 5 as *Metopaster tumidus* Spencer (probably var. *radiatus*).

**E 13273** **Paratypes.** Cretaceous, Upper Campanian, upper *muconata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 113, 175,



pl. 14 fig. 2. Fig. 2 is a reconstruction from several components.

**Metopaster tumidus Spencer (probably var. radiatus)**

**E 13269** See: *Metopaster tumidus* Spencer

**Metopaster uncatu**s Forbes

**OR 35488, OR 35496, OR 46776a** See: *Metopaster uncatu* (Forbes)

**Metopaster uncatu**s (Forbes)

**E 20264** Paratype of *Metopaster quadratus* Spencer. Cretaceous, Campanian, *quadratus* Zone. level b. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 97–99, text figs 1a–d as *Metopaster quadratus* Spencer.

**E 20265** Holotype of *Metopaster quadratus* Spencer. Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 97–99, text figs 2a–d as *Metopaster quadratus* Spencer. Figd Gale, A. S. 1986: 43, pl. 6 fig. 4.

**E 20269** Cretaceous, Santonian, *coranguinum* Zone. Micheldever, Hampshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Gale, A. S. 1986: 43, pl. 5 fig. 6.

**OR 35488** Cretaceous. Upper Chalk. Kent, England. Taylor, H. W. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 50, 51, pl. 14 figs 1a,b as *Metopaster uncatu*s Forbes.

**OR 35496** Cretaceous. Upper Chalk. Kent, England. Old Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 49, pl. 11 figs 3a,b as *Metopaster uncatu*s Forbes.

**OR 46776a** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. 27th October 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 48, 49, 50, pl. 14 figs 2a–d as *Metopaster uncatu*s Forbes. A specimen of *M. cingulatus* Sladen also bears the same registration number. The distinction is made by the suffixes a and b.

**OR 51413** Cretaceous. Upper Chalk. Near Bromley, Kent, England. No collection data. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 36, pl. 11 figs 2a–c as *Metopaster parkinsoni* Forbes.

**OR 51414** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Presd Marquis of Northampton. Figd Wright, C. W. & Smith, A. B. 1987: 213, 214, pl. 47 fig. 7.

**OR 57528** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Purchd Simmons, J. 30th October 1871. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: pl. 10 figs 4a–c as *Metopaster parkinsoni* Forbes 1907: 124 as *Metopaster uncatu*s (Forbes).

**Metopaster undulatus** Spencer

**E 13274** Holotype. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 118, 176, pl. 15 fig. 20.

**E 13275–7** Paratypes. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 118, 119, 176, pl. 15 figs 21, 22 (E 13275), 23 (E 13276), 24, 24a (E 13277).

**E 13278** Paratypes. Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 118, 171,

pl. 10 fig. 19. The figure is of a reconstructed margin with several ossicles.

**Metopaster zonatus** Sladen

**E 2575** Syntype. Cretaceous. Upper Chalk. Near Bromley, Kent, England. Old Colln. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 45–47, pl. 12 figs 2a–c.

**E 2606** Syntype? Cretaceous. Upper Chalk. England. Old Colln. Type refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 45–47. This is possibly one of the specimens referred to by Sladen.

**E 13028** (ex. E 150) Syntype? Cretaceous. Upper Chalk. England. Presd Bright, B. 1873. Type refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 45–47. This is possibly one of the specimens referred to by Sladen.

**OR 57570** Syntype? Cretaceous. Upper Chalk. Bromley, Kent, England. Purchd Simmons, J. February 1873. Type refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 45–47. This is possibly one of the specimens referred to by Sladen.

**OR 75550** Syntype? Cretaceous. Upper Chalk. Bromley, Kent, England. Purchd Simmons, J. August 1873. Type refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1893: 45–47. This is possibly one of the specimens referred to by Sladen.

**Mitraster hunteri** Forbes

**E 2583, E 13084, E 13279, E 20961–2, OR 40274, OR 46766a, OR 46766b** See: *Metopaster hunteri* (Forbes)

**Mitraster rugatus** Forbes

**E 2584, E 2585, E 13079** See: *Metopaster rugatus* (Forbes)

## N

**Nymphaster angustatus** (Forbes)

**E 2580** Cretaceous. Upper Chalk. No locality data. Bowerbank Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 23, 24, pl. 9 figs 1a–b as *Pycnaster angustatus* Forbes; 1907: 95 as *Pycnaster angustatus* Sladen.

**Nymphaster coombii** Forbes

**E 3350, OR 35503, OR 46623** See: *Nymphaster coombii* (Forbes)

**Nymphaster coombii** (Forbes)

**E 3349** (ex. 76002) Cretaceous, Cenomanian. Lower Chalk. Folkestone, Kent, England. No collection data. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 18, pl. 7 figs 2a–b as *Nymphaster? coombii* Forbes.

**E 3350** (ex. 76002) Cretaceous, Cenomanian. Lower Chalk. Glynde, Sussex, England. No collection data. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 18, pl. 7 figs 3a–b as *Nymphaster coombii* Forbes.

**E 13724** Cretaceous, Santonian, *coranguinum* Zone. Northfleet, Kent, England. Dibley, G. E. Colln 1922. Figd Schulz, M.-G. & Weitschat, W. 1975: 275, pl. 29 figs. 3,4 as *Chomataster coombii* (Forbes). Figd Gale, A. S. 1988 (1987a): 154, 157, 159, text figs 1D,E (as E 12734), pl. 4 fig. 4.

**OR 35503** Holotype of *Goniaster (Astrogonium) coombii* Forbes. Cretaceous, Turonian, *cuvieri* Zone. Lower Chalk. Balcombe Pit, Amberley, Sussex, England. Colld Coombe, G. Dixon, F. Colln. Figd Forbes, E. 1848: 474 as *Goniaster (Astrogonium) coombii* Forbes. Figd Forbes, E. in Dixon, F. 1850: 334, pl. 23 fig. 6 as *Goniaster (Astrogonium) coombii*

Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 367, 368, 440, pl. 23 fig. 6 as *Goniaster (Astrogonium) coombii* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 16, 17, pl. 8 figs 1a,b as *Nymphaster coombii* Forbes.

**OR 46623** Cretaceous, Cenomanian. Lower Chalk. Betchworth, Surrey, England. Purchd Simmons, J. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 17, pl. 7 figs 1a–e as *Nymphaster coombii* Forbes.

**OR 48620** Cretaceous, Albion. Upper Greensand. Isle of Wight, England. Saxby, Rev. W. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: pl. 19 fig. 3 as *Nymphaster coombii* Forbes 1907: 123 as *Calliderma smithiae* (Forbes).

#### *Nymphaster humilis* (Schultz & Weitschat)

**E 54301** Cretaceous, late Coniacian. 2m beneath Phosphatic Hardground. Hardvilliers, near Breteuil, Picardy, France. Gale, A. S. Colln. Figd Gale, A. S. 1988 (1987a): 161, pl. 2 fig. 5.

#### *Nymphaster humilis* (Schulz & Weitschat)

**E 28407a,b** **Holotype.** Cretaceous, Santonian, *corangium* Zone. North Foreland, Kent, England. Coll'd 1884. Rowe, A. W. Colln. Purchd November 1926. Figd Schulz, M.-G. & Weitschat, W. 1975: 275–276, pl. 29 figs. 1 (E 28407a), 2 (E 28407b) — both referred to under E 28407 as *Chomataster humilis* Schulz & Weitschat. Figd Gale, A. S. 1988 (1987a): 161, pl. 2 fig. 3 (E 28407a under E 28407).

#### *Nymphaster marginatus* Sladen

**OR 35484** **Holotype.** Cretaceous, Santonian, *corangium* Zone. Upper Chalk. Near Bromley, Kent, England. Taylor, H. W. Colln. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 18–19, pl. 7 figs. 4a–b. Figd Rasmussen, H. W. 1950: 79, 83–84, text figs 6b?, 6g as *Chomataster marginatus* (Sladen). Figd Gale, A. S. 1988 (1987a): 159, 166, pl. 4 fig. 10. Since figuring by Sladen, some of the matrix has been removed from the specimen.

#### *Nymphaster obtusus* (Forbes)

**OR 35481** Cretaceous, Senonian. Upper Chalk. Kent, England. Taylor, H. W. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 75, 76, pl. 22 figs 2, 2a as *Pentagonaster obtusus* Forbes.

**OR 40400** Cretaceous, Senonian. Upper Chalk. Kent, England. Purchd Simmons, J. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 75, 76, pl. 22 figs 1, 1a, 1b as *Pentagonaster obtusus* Forbes.

**E 5038** (ex. 48084) **Syntype** of *Oreaster obtusus* Forbes. **Lectotype.** Cretaceous, Senonian. Upper Chalk. Lancing, Sussex, England. Dixon, F. Colln. Refd Forbes, E. 1848: 468 as *Oreaster obtusus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 330, pl. 21 fig. 12 left as *Oreaster obtusus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 364, 370, 439, pl. 21 fig. 12 left as *Oreaster obtusus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 75, 76, pl. 22 figs 3b–g as *Pentagonaster obtusus* Forbes. Type figd Gale, A. S. 1988 (1987a): 155 (as E 50838), 166, pl. 4 figs 7A–C. E 5038 and E 5039 were once joined together by matrix, but since figuring by Forbes, have been separated.

**E 5039** (ex. 48084) **Syntype** of *Oreaster obtusus* Forbes. **Paralectotype.** Cretaceous, Senonian. Upper Chalk. Lancing, Sussex, England. Dixon, F. Colln. Refd Forbes, E. 1848: 468 as *Oreaster obtusus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 330, pl. 21 fig. 12 right as *Oreaster obtusus* Forbes. Figd

Forbes, E. in Dixon, F. & Jones, T. R. 1878: 364, 370, 439, pl. 21 fig. 12 right as *Oreaster obtusus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 75, pl. 22 fig. 3a as *Pentagonaster obtusus* Forbes. E 5038 and E 5039 were once joined together by matrix, but since figuring by Forbes, have been separated.

**E 20273** Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum. Figd Gale, A. S. 1988 (1987a): 155, pl. 4 fig. 6.

**E 20566** Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum. Figd Gale, A. S. 1988 (1987a): 155, pl. 4 fig. 9.

#### *Nymphaster oligoplax* Sladen

**OR 40178** See: *Ophryaster oligoplax* (Sladen)

#### *Nymphaster radiatus* Spencer

**E 375** See: *Spenceraster radiatus* (Spencer)

#### *Nymphaster rugosus* Spencer

**OR 57516** See: *Spenceraster rugosus* (Spencer)

#### *Nymphaster studlandensis* (Schulz & Weitschat)

**E 54300** Cretaceous, ?low Upper Campanian. Hallem-baye, near Maastricht, Holland (Belgium, according to Gale). Gale, A. S. Colln. Figd Gale, A. S. 1988 (1987a): 163, pl. 5 fig. 1.

#### *Nymphaster?* *coombii* Forbes

**E 3349** See: *Nymphaster coombii* (Forbes)

## O

#### *Onychaster flexilis* Meek & Worthen

**E 2686** Lower Carboniferous. Keokuk Group. Crawfordsville, Indiana, U. S. A. Braun, F. Colln. Purchd 1889. Figd Spencer, W. K. (1914–1940) 1925: pl. 21 fig. 12; 1927: 339.

#### *Ophidiaster?* *davidsoni* de Loriol

**E 53996** (ex. E 1499) **Holotype.** Jurassic, Portlandian. Boulogne-sur-Mer, France. Wright, T. Colln. Purchd Butler, F. H. May 1887. Type figd Loriol, P. de, in Loriol, P. de & Pellat, E. 1875: 293–294, pl. 26 figs 13, 14 as *Ophidiaster?* *davidsoni* Wright. Matrix was removed subsequent to figuring.

#### *Ophidiaster?* *davidsoni* Wright

**E 53996** See: *Ophidiaster?* *davidsoni* de Loriol

#### *Ophryaster magnus* Spencer

**E 13280** **Holotype.** Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 130, 177, pl. 16 fig. 25.

**E 13281–5** **Paratypes.** Cretaceous, Upper Campanian, upper *mucronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Type figd Spencer, W. K. 1913: 177, pl. 16 figs 20 (E 13281), 22 (E 13284), 24 (E 13283), 23?, 26 (E 13282), 27 (E 13285). E 13281 is a restored portion of a specimen and is formed from four ossicles.

#### *Ophryaster oligoplax* (Sladen)

**OR 40178** **Holotype** of *Nymphaster oligoplax* Sladen. **Type species** of *Ophryaster* Sladen 1913 : 129–130. Creta-



ceous, Santonian, *coranguinum* Zone. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: 19–21, pl. 8 figs 3a,b as *Nymphaster oligoplax* Sladen. Type refigd Spencer, W. K. 1913: 129–130.

#### **Ophryaster sulcatus Sladen**

**E 54070** Cretaceous, Cenomanian. Wilmington Sands, 5.14–9.10m below datum. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 200, pl. 42 figs 1a,b.

#### **Ophryaster sulcatus (Sladen)**

**E 5063** (ex. 75921) **Holotype** of *Tomidaster sulcatus* Sladen. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Presd Townsend, R. M. 1877. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1891: pl. 5 figs 1a–c as *Tomidaster sulcatus* Sladen; 1907: 123–124 as *Calliderma smithiae* (Forbes).

#### **Oreaster bulbiferus Forbes**

**OR 48748** See: *Stauranderaster bulbiferus* (Forbes)

#### **Oreaster coronatus Forbes**

**OR 35480** See: *Stauranderaster coronatus* (Forbes)

#### **Oreaster obtusus Forbes**

**E 5038, E 5039** See: *Nymphaster obtusus* (Forbes)

#### **Oreaster ocellatus Forbes**

**E 2571** See: *Valettaster ocellatus* (Forbes)

#### **Oreaster pistilliferus Forbes**

**OR 57634, E 2564, E 5037** See: *Stauranderaster pistilliferus* (Forbes)

#### **Oreaster sp.**

**E 2566** See: *Valettaster argus* (Spencer)

#### **Ossicula of Asteriidae**

**E 13573–4** See: '*Astropecten*' sp.

## **P**

#### **Palaeaster caractaci Gregory**

**52857a,b** See: *Siluraster caractaci* (Gregory)

#### **Palaeaster caractaci Salter MS**

**E 52857a,b** See: *Siluraster caractaci* (Gregory)

#### **Palaeaster sp.**

**E 13952** See: *Urasterella ruthveni* (Forbes) var. *leintwardinensis* Spencer

#### **Palaeasterina bonneyi Gregory**

**OR 40299a,b** See: *Palasterina antiqua* (Hisinger)

#### **Palaeosolaster gregoryi Stürtz**

**E 4364** Lower Devonian. Bundenbach, Germany. Krantz, F. Colln. Purchd 1899. Figd Spencer, W. K. (1914–1940) 1925: 238, 239, 240, pl. 18 fig. 2.

**E 4997** **Holotype** of *Echinostella traquairi* Stürtz. **Type species** of *Echinostella* Stürtz 1899 : 233–235. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 233–235, pl. 3 fig. 11, pl. 4 fig. 12 as *Echinostella traquairi* Stürtz.

**E 4998** **Syntype A** of *Echinodiscus multidactylus* Stürtz. **Type species** of *Echinodiscus* Stürtz 1899 : 231–233. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 231–233, pl. 3 figs 9, 10 as *Echinodiscus multidactylus* Stürtz.

**E 4999** **Syntype B** of *Echinodiscus multidactylus* Stürtz. **Type species** of *Echinodiscus* Stürtz 1899 : 231–233. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 231–233, pl. 3 figs 6–8 as *Echinodiscus multidactylus* Stürtz.

**E 5000** **Syntype A** of *Echinasterias spinosus* Stürtz. **Type species** of *Echinasterias* Stürtz 1899 : 230. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type refigd Stürtz, B. 1900 (1899): 230 as *Echinasterias spinosus* Stürtz.

**E 5001** **Syntype B** of *Echinasterias spinosus* Stürtz. **Type species** of *Echinasterias* Stürtz 1899. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 230–231, pl. 2 fig. 5 as *Echinasterias spinosus* Stürtz. Figd Spencer, W. K. (1914–1940) 1925: 238, 239, 240, text figs 173a,b.

**E 5002** **Holotype**. **Type species** of *Palaeosolaster* Stürtz 1899 : 226. Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Type figd Stürtz, B. 1900 (1899): 226–229, pl. 2 figs 1–3. Figd Spencer, W. K. (1914–1940) 1925: 238, 239, 240, text fig. 172?

#### **Palaeostella solida Stürtz**

**E 3485** **Holotype**. **Type species** of *Palaeostella* Stürtz, 1890: 230–231. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 230–231, pl. 31 figs 42, 43, 43a.

**E 3724** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd 1894. Figd Stürtz, B. 1893: pl. 1 figs 5–8.

#### **Palasterina antiqua (Hisinger)**

**OR 40299a,b** **Holotype** of *Palaeasterina bonneyi* Gregory. Silurian. Lower Ludlow Shales. Church Hill, Leintwardine, Herefordshire, England. Old Colln. Type figd Gregory, J. W. 1899: 40299a: 349–350, text figs 1, 3a, pl. 16 fig. 2a; 40299b: 349–350, text figs 2, 3b, pl. 16 fig. 2b as *Palaeasterina bonneyi* Gregory. Figd Spencer, W. K. (1914–1940) 1922: 222, 228, 229, 233, text fig. 169, pl. 16 fig. 1 (40299a); 222, 228, 229, 232, 233, text fig. 168, pl. 16 fig. 2 (40299b).

**OR 40301** Silurian. Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Marston, A. Colln. 1862. Figd Spencer, W. K. (1914–1940) 1916: pl. 4 fig. 6 as *Palasterina primaeva* Forbes; 1922: 221, 222, 228, 229, 231, 232, 233, text fig. 158b.

#### **Palasterina follmanni Stürtz**

**E 3469** **Syntype**. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 226–228, pl. 29 fig. 29.

**E 3470** **Syntype**. **Lectotype**. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 226–228, pl. 29 figs 30, 30a (fig. 30a is reversed). Type refigd Owen, H. G. 1965: 563. Selected as lectotype by Owen.

**E 3471** **Syntype**. **Paralectotype**. Lower Devonian. Bun-

denbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 226–228, pl. 29 fig. 29. E 3470 selected as lectotype by Owen; E 3471 is a syntype of Stürtz.

**E 5004** Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, south slope of Hunsrück, Rhineland, Germany. Stürtz, B. Colln. Purchd June 1900. Figd Spencer, W. K. (1914–1940) 1922: 235; 1925: 237, pl. 20 fig. 1.

**E 13625** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 1910. Figd Spencer, W. K. (1914–1940) 1922: 222, 235, 236, pl. 16 fig. 4; 1925: 237.

**E 13626** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 1910. Figd Spencer, W. K. (1914–1940) 1922: 201, 222, 235, 236, pl. 16 fig. 7.

**E 13629** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 23rd. 1910. Figd Spencer, W. K. (1914–1940) 1922: 201, 222, 235, 236, pl. 16 fig. 6.

**E 13635** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 1910. Figd Spencer, W. K. (1914–1940) 1922: 222, 235, 236, text fig. 171, pl. 16 fig. 3; 1925: 237; 1940: 508.

**E 13636** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd April 1910. Figd Spencer, W. K. (1914–1940) 1922: 222, 235, 236, pl. 16 fig. 5; 1925: 237.

#### **Palasterina primaeva (Forbes)**

**E 4991** Silurian. Lower Ludlow. Underbarrow, near Kendal, Westmoreland, England. Morris, J. Purchd 1867. Figd Spencer, W. K. (1914–1940) 1922: 185, 223, 224, pl. 15 fig. 7.

#### **Palasteriscus devonicus Stürtz**

**E 3466** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 223–225, pl. 28 figs 23, 23a, 23b, pl. 29 fig. 24.

**E 3467** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd. Figd Spencer, W. K. (1914–1940) 1919: 170, 172, 174, 177, text fig. 119 (recorded on p. 177 as E 3407).

**E 5026** Lower Devonian. Hunsrückshiefer. Bundenbach, near Birkenfeld, Rhineland, Germany. Stürtz, B. Colln. Purchd September 1902. Figd Spencer, W. K. (1914–1940) 1919: 177, possibly text fig. 122; 1922: pl. 14 fig. 4.

#### **Pentaceros abbreviatus Spencer**

**OR 57538** See: *Hadranderaster abbreviatus* (Spencer)

#### **Pentaceros bispinosus Spencer**

**OR 35482** See: *Stauranderaster bispinosus* (Spencer)

#### **Pentaceros boysii Forbes**

**OR 46600, OR 48083** See: *Stauranderaster boysii* (Forbes)

#### **Pentaceros bulbiferus Forbes**

**OR 40399, OR 48748, OR 40175, E 5040, E 5041, E 5042** See: *Stauranderaster bulbiferus* (Forbes)

#### **Pentaceros coronatus Forbes**

**OR 35480, E 2562** See: *Stauranderaster coronatus* (Forbes)

#### **Pentaceros ocellatus Forbes**

**E 5012** See: *Valettaster ocellatus* (Forbes)

#### **Pentaceros pistilliferus Forbes**

**OR 57634, E 2564, E 5037** See: *Stauranderaster pistilliferus* (Forbes)

#### **Pentaceros punctatus Spencer**

**E 2561** See: *Stauranderaster senonensis* Valette

#### **Pentaceros sp.**

**OR 5514** See: *Pycinaster angustatus* (Forbes)

#### **Pentagonaster megaloplax Sladen**

**OR 46779, E 2582, E 5064, E 5065** See: *Crateraster quinqueloba* (Goldfuss)

#### **Pentagonaster obtusus Forbes**

**OR 35481, OR 40400, E 5038, E 5039** See: *Nymphaster obtusus* (Forbes)

#### **Pentagonaster quinqueloba (Goldfuss)**

**OR 46779, E 2582, E 5064, E 5065** See: *Crateraster quinqueloba* (Goldfuss)

#### **Pentagonaster robustus Spencer**

**OR 48085** See: *Pycinaster angustatus* (Forbes)

#### **Pentagonaster robustus Spencer**

**OR 48085** See: *Pycinaster angustatus* (Forbes)

#### **Pentasteria (Archastropecten) cotteswoldiae (Buckman)**

**E 1633** Jurassic, Bathonian. Stonesfield Slate. Eyeford, near Naunton, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. May 1887. Figd Wright, T. (1863–1880) 1863: 116–118, pl. 10 figs 1a–c as *Astropecten cotteswoldiae* Buckman.

**E 1634** Jurassic, Bathonian. Stonesfield Slate. Eyeford, near Naunton, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. May 1887. Figd Wright, T. (1863–1880) 1863: 116–118, pl. 9 figs 3a–c as *Astropecten cotteswoldiae* Buckman.

**E 1635** Jurassic, Bathonian. Stonesfield Slate. Eyeford, near Naunton, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. May 1887. Figd Wright, T. (1863–1880) 1863: 116–118, pl. 9 figs 1a, b as *Astropecten cotteswoldiae* Buckman.

**E 1636** Jurassic, Bathonian. Stonesfield Slate. Eyeford, near Naunton, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. May 1887. Figd Wright, T. (1863–1880) 1863: 116, pl. 9 fig. 4 as *Astropecten cotteswoldiae* Buckman.

#### **Pentasteria (Archastropecten) cotteswoldiae (Buckman) var. stamfordensis (Wright)**

**OR 75797** **Holotype.** Jurassic, Aalenian, *murchisonae* Zone. Inferior Oolite, Collyweston Slate. St. Martin parish, Stamford, Northamptonshire, England. Colld Sharp, S. 13th. April 1853. Acquired 1876. Type figd Wright, T. (1863–1880) 1863: 118–120, pl. 6 figs 1a, b as *Astropecten cotteswoldiae* var. *stamfordensis* Wright.

#### **Pentasteria (Archastropecten) cotteswoldiae (Buckman) var. stonessfieldensis (Wright)**

**E 2588** **Holotype.** Jurassic, Bathonian. Stonesfield Slate. Oxfordshire, England. Johnson, J. R. Colln. Purchd 1845. Type figd Wright, T. (1863–1880) 1863: 121 as *Astropecten cotteswoldiae* var. *stonessfieldensis* Wright; pl. 8 fig. 2 as *Astropecten cotteswoldiae* var. *stonessfieldensis* Wright.

#### **Pentasteria (Archastropecten) cf huxleyi (Wright)**

**E 28383** (ex. E 941) Jurassic. Great Oolite. 1205 feet down in borehole, near Richmond Bridge, Surrey, England. Presd Judd, J. W. July 1885. Figd Hess, H. 1955: 16, text fig. 7 as *Archastropecten cf huxleyi* (Wright).

#### **Pentasteria (Archastropecten) huxleyi (Wright)**

**OR 33848** **Holotype** of *Astropecten huxleyi* Wright. Type species of *Archastropecten* Hess 1955 : 27. Jurassic, Batho-



nian, *discus* Zone. Forest Marble. Near Malmesbury, Wiltshire, England. Buy, W. Colln 1854. Type figd Wright, T. (1863–1880) 1863: 123–125, pl. 8 figs 1a–d as *Astropecten huxleyi* Wright. Type refd Hess, H. 1955: 27 as *Archastropecten huxleyi* (Wright).

**Pentasteria (Archastropecten) lorioli (de Loriol)**

**E 1639 Holotype** of *Astropecten lorioli* Wright. Jurassic, Portlandian. Boulogne-sur-Mer, France. Wright, T. Colln. Purchd Butler, F. H. May 1887. Type figd Loriol, P. de, in Loriol, P. de & Pellat, E. 1875: 292–293, pl. 26 fig. 12 as *Astropecten lorioli* Wright.

**Pentasteria (Archastropecten) portlandicus (Hess)**

**E 13739 Holotype** of *Archastropecten portlandicus* Hess. Jurassic, Portlandian, *pseudogigas* Zone. Basal shell bed of Portland Stone. West coast of Isle of Portland, Dorset, England. Colld Cunningham, R. H. Presd October 1925. Type figd Hess, H. 1955: 53–54, pl. 4 figs 4–6 as *Archastropecten portlandicus* Hess.

**E 13740a** Jurassic, Portlandian, *pseudogigas* Zone. Basal shell bed of Portland Stone. West coast of Isle of Portland, Dorset, England. Colld Cunningham, R. H. Presd October 1925. Type figd Hess, H. 1955: 53, 54, text figs 13–15 (E 13740) as *Archastropecten portlandicus* Hess.

**Pentasteria (Archastropecten) procera Hess**

**E 5021 Holotype**. Jurassic, Bajocian. Inferior Oolite, about 14 feet from surface of middle bed of Freestone. Guiting Power, 10 miles east of Cheltenham, Gloucestershire, England. Presd Burrows, H. W. 22nd March 1902. Type figd Hess, H. 1960a: 331–334, pl. 1.

**Pentasteria (Archastropecten) wittsii (Wright)**

**E 1637 Holotype** of *Astropecten wittsii* Wright. Jurassic, Bathonian. Stonesfield Slate. Eyeford, near Naunton, Gloucestershire, England. Colld Witts, Rev. E. F. Wright, T. Colln. Purchd Butler, F. H. May 1887. Type figd Wright, T. (1863–1880) 1863: 120–121, pl. 9 figs 2a,b as *Astropecten wittsii* Wright. According to a label written by L. Bairstow and stored with the specimen, E 1637 was filmed by the '... Shell Film Unit, 15th. Oct. 1957, for an educational film directed by H. van Calder.'

**Petraster kinahani (Baily)**

**E 194** Ordovician, Caradocian. Ballymoney Series. West of Ballymadden Point, near Bannow, County Wexford, Ireland. Purchd Baily, W. H. May, 1882. Figd Spencer, W. K. (1914–1940) 1916: 105, 106, text fig. 60 pl. 5 fig. 2.

**E 13110a–d** (ex. E 194) Ordovician, Caradocian. Ballymoney Series. West of Ballymadden Point, near Bannow, County Wexford, Ireland. Purchd Baily, W. H. May, 1882. Figd Spencer, W. K. (1914–1940) 1916: 105, 106, text fig. 61 (E 13110b, not E 13110a as stated in text); 1918: 109, 110, 146, pl. 5 figs 4 (E 13110d), 5 (E 13110a).

**Phocidaster grandis Spencer**

**E 54361** (ex. Wright & Wright coll. no. 24631) Cretaceous, Cenomanian. bed 2. Pit 2, Wilmington, Devon, England. Wright, C. W. & E. V. Colln. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 197, 198, pl. 41 figs 4a,b.

**Promopalaeaster elizae (Spencer)**

**E 52399a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd

Spencer, W. K. (1914–1940) 1916: 96, 97 (E52399a); 92, 96, 97, text figs 57, 58 (E 52399b).

**E 52404a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1916: 63, 92, 93, text fig. 51 (E 52404a); 95, pl. 4 fig. 5 (E 52404b).

**E 52423a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1916: 67, 92, 93, 96, text figs 55, 56, pl. 4 fig. 3; 1919: 171 (E 52423a; counterpart E 52423b is not figured).

**E 52478a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1916: 92, 93, 94, text fig. 53 (E 52478a); 92, 93, pl. 4 fig. 4 (E 52478b).

**E 52588a,b** **Holotype**. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1916: 63, 64, 92–97, text figs 51, 52, pl. 4 fig. 1; 1918: 146 (E 52588a); 1916: 92–97, pl. 4 fig. 2; 1919: 185 (E 52588b).

**Protaster brisingoides Gregory**

**E 13000, E 13002** See: *Sturtzura brisingoides* (Gregory)

**E 13001** See: *Sturtzura spryi* Chapman

**Protopalaeaster ordovicus Spencer**

**E 52416a,b** **Holotype**. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1916: 63, 73, 74, text fig. 36, pl. 2 figs 6, 6a; 1919: 179 (E 52416a); 1916: 73, pl. 3 fig. 3; 1919: 179, 185 (E 52416b).

**Protopalaeaster sculptus (Spencer)**

**E 52539** See: *Girvanaster sculptus* Spencer

**Protopalaeaster sp**

**E 53918** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Presd June, 1937. Figd Gale, A. S. 1987b: fig. 7E.

**Pycinaster angustatus (Forbes)**

**OR 5514** Cretaceous. Chalk. No locality data. Mantell, G. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 89, pl. 25 fig. 7 as *Pentaceros* sp. 1907: 95 as *Pycinaster angustatus* Sladen.

**OR 48085** **Holotype** of *Pentagonaster robustus* Spencer. Cretaceous, Senonian. Upper Chalk. Sussex, England. Mantell, G. Colln 1853. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 73–74, pl. 21 figs 2, 2a as *Pentagonaster robustus* Spencer 1907: 95 as *Pycinaster angustatus* (Forbes). Spencer, 1907, revised his opinion as to the identity of the specimen when he wrote that it was '... probably an immature form. . . of *P. angustatus*.'

**Pycinaster angustatus Forbes**

**E 2580** See: *Nymphaster angustatus* (Forbes)

**Pycinaster angustatus Sladen**

**OR 5514** See: *Pycinaster angustatus* (Forbes)

**Pycinaster crassus** Spencer

E 2576 **Paratype**. Cretaceous. Upper Chalk. No locality data. Mantell, G. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 96, 97, pl. 29 fig. 1.

E 2628 **Paratype**. Cretaceous. Upper Chalk. England. Mantell, G. Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 96, pl. 29 fig. 5. This specimen has been lost.

E 2631a **Paratype**. Cretaceous. Upper Chalk. England. Bowerbank Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: pl. 29 figs 3, 3a (under E 2631).

E 2632a,b **Paratypes**. Cretaceous. Upper Chalk. England. Bowerbank Colln. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: pl. 29 figs 4 (E 2632a), 4a (E 2632b), (both under E 2632); 1908: 133.

E 13291–5 Cretaceous, Upper Campanian, upper *micronata* Zone. Rügen, Germany. Purchd Laur, A. 27th October 1906. Figd Spencer, W. K. 1913: 177, pl. 16 figs 1, 3 (E 13291), 2 (E 13292), 125, pl. 16 figs 4 (E 13293), 5 (E 13294), 6, 6a (E 13295).

OR 35498 **Holotype**. Cretaceous. Upper Chalk. Kent, England. Taylor, H. W. Colln. Purchd 1854. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 96–97, pl. 29 figs 2, 2a.

**Pycinaster humilis** Spencer

E 20963–4 **Paratypes**. Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 124, 172, pl. 11 figs 11 upper (E 20963), lower (E 20964).

**Pycinaster magnificus** Spencer

E 20424 Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 95, 96, pl. 29 fig. 6 as *Pycinaster senonensis* Valette.

E 20440–1 Cretaceous, Senonian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Wright, C. W. & Smith, A. B. 1987: 216, pl. 47 figs 1 (E 20440), 2 (E 20441). The figures are reversed.

**Pycinaster senonensis** Valette

E 2561 See: *Stauranderaster senonensis* Valette

E 20424 See: *Pycinaster magnificus* Spencer

E 20431 See: *Stauranderaster senonensis* (Valette)

**Pycinaster** sp.

E 54036 Cretaceous, Cenomanian, lowest part of Wilmington Sands, 6.47–9.75m below datum. The White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Presd Gale, A. S. November 1988. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 195, 197, pl. 41 figs 3a,b (under E 54034).

**Pycinaster angustatus** Forbes and **Pycinaster angustatus** Sladen

E 2580 See: *Nymphaster angustatus* (Forbes)

**R****Recurvaster blackmorei** Rasmussen

E 13933 **Holotype**. Cretaceous, Campanian, *quadratus* Zone. level b. East Harnham, near Salisbury, Wiltshire,

England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Type figd Rasmussen, H. W. 1950: 64–66, pl. 6 figs 1–7. Figd Gale, A. S. 1986: 45, 47, pl. 9 fig. 5.

E 20275 Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Gale, A. S. 1986: 45, 47, pl. 9 figs 6A,B.

**S****Schuchertia laxata** (Schuchert)

E 52652 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1919: 177, 186, text fig. 126; 1922: 212, 218.

E 52698 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1922: 212, 213, text fig. 151, 214, pl. 15 fig. 1.

E 52699 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1922: 212–214, text fig. 153.

E 52700 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1922: 212–214, text fig. 153.

**Siluraster caractaci** (Gregory)

E 52857a,b (ex. OR 48206) **Holotype** of *Palaeaster caractaci* Gregory. Ordovician, Caradoc. Caradoc Sandstone. Soudley Quarry?, Church Stretton, Shropshire, England. Colld Ketley, C. Purchd March 1867. Type refd Gregory, J. W. 1899: 344–345 as *Palaeaster caractaci* Salter MS. According to Gregory, 'The specimen . . . is contained in a small nodule, and is labelled from the Soudley Quarry. Mr. R. A. Buddacombe has . . . expressed doubt as to the exact correctness of this locality.' Figured herein, figs 1a,b.

**Solaster moretonis** Forbes

OR 40421 **Holotype**. Jurassic, Bathonian. Great Oolite, oolitic freestone. Windrush Quarry, Northleach, Gloucestershire, England. Colld Moreton, H. J., third Earl of Ducie. Presd 1863. Type figd Forbes, E. 1856: 1–3, pl. 1. Figd Wright, T. (1863–1880) 1863: 104–106, pl. 4 figs 1a–e.

**Solaster murchisoni** (Williamson)

E 13750 Jurassic, Pliensbachian, *capricornus* Zone. Lias, Starfish Bed. Huntcliff, east of Saltburn, Cleveland, England. Colld Crewdson, Canon G. Presd Kendal Borough Museum December 1926. Figd Blake, J. F. 1887: 529–531, pl. 15 figs 1, 2.

**Spenceraster radiatus** (Spencer)

E 375 **Holotype** of *Nymphaster radiatus* Spencer. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. South-east England. Gardner, J. Starkie Colln. Purchd 24th May 1884. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 73, pl. 25 figs 1a,b as *Nymphaster radiatus* Spencer.

E 13303 Cretaceous, Cenomanian, *varians* Zone. Near Cambridge, Cambridgeshire, England. Purchd Mockler, F. 28th October 1911. Figd Spencer, W. K. 1913: 131, 174,



pl. 13 fig. 27 as *Trachyaster radiatus* Spencer.

**Spenceraster rugosus (Spencer)**

**OR 57516** **Holotype** of *Nymphaster rugosus* Spencer. Type species of *Spenceraster* Lambert 1914 : 27. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Griffiths, W. Colln. Purchd. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 94, pl. 29 figs 7, 7a as *Nymphaster rugosus* Spencer. Type refd Lambert, J. 1914: 27.

**Stauranderaster argus Spencer**

**E 2566, E 5019, E 20294** See: *Valettaster argus* (Spencer)

**Stauranderaster bispinosus (Spencer)**

**OR 35482** **Holotype** of *Pentaceros bispinosus* Spencer. Cretaceous, Senonian. Upper Chalk. Sittingbourne, Kent, England. Taylor, H. W. Colln 1854. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 87, pl. 23 figs 3, 3a–c as *Pentaceros bispinosus* Spencer; 1907: 125 as *Stauranderaster bispinosus* (Spencer).

**Stauranderaster boysii (Forbes)**

**OR 46600** Cretaceous. Upper Chalk. Near Bromley, Kent, England. Simmons, J. Colln. Purchd. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 80, pl. 22 figs 4, 4a–c as *Pentaceros boysii* Forbes 1907: 125 as *Stauranderaster boysii* (Forbes).

**OR 48083** Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Dixon, F. Colln 1850. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 80, pl. 23 figs 1, 1a, b as *Pentaceros boysii* Forbes; 1907: 125 *Stauranderaster boysii* (Forbes).

**Stauranderaster bulbiferus Forbes**

**E 20965, E 20966** See: *Stauranderaster bulbiferus* (Forbes)

**Stauranderaster bulbiferus (Forbes)**

**E 4344a** Cretaceous. Chalk. Charlton, Kent, England. Ogle Colln. Purchd 27th June 1891. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 132, text fig. 34 (under E 4344). See also *Valettaster argus* (Spencer), E 4344b. The block of Chalk contains *S. bulbiferus* and *V. argus*.

**E 5040** (ex. 48210) Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln ca. 1870. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77–79, pl. 21 figs 1, 1a, b as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes).

**E 5041** (ex. 48210) Cretaceous, Senonian. Upper Chalk. Bromley?, Kent, England. Simmons, J. Colln. Purchd 1870. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77, pl. 21 figs 3, 3a as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes).

**E 5042** (ex. 46765) Cretaceous, Senonian. Upper Chalk. Charlton, Kent, England. Simmons, J. Colln. Purchd 1878. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77, pl. 23 figs 2, 2a as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes).

**E 20965** Cretaceous, Campanian, *mucronata* Zone. Isle of Wight, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 133, 134, pl. 13 figs 6, 7 as *Stauranderaster bulbiferus* Forbes.

**E 20966** Cretaceous, Turonian, *cuvieri* Zone. Branscombe, Devon, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 133, pl. 13 fig. 8

as *Stauranderaster bulbiferus* Forbes.

**OR 40175** Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln 1870. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77, 79, pl. 20 figs 1a–c as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes).

**OR 40399** Cretaceous, Santonian, *coranguinum* Zone. Upper Chalk. Bromley, Kent, England. Charlesworth, E. Colln 1863. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77, pl. 21 figs 4, 4a as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes).

**OR 48748** Cretaceous, Santonian, *coranguinum* Zone. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln 1873. Figd Carpenter, P. H. 1882: 529–533, pl. 12 as *Oreaster bulbiferus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 77, 78, 79, pl. 20 figs 2, 2a–b as *Pentaceros bulbiferus* Forbes; 1907: 125 as *Stauranderaster bulbiferus* (Forbes). There are four other specimens on this slab, which altogether form an impressive display. However, they are attached to the slab by plaster of paris, with a steel bar inserted for strength, showing that the slab is composite, a sort of 'fake'.

**Stauranderaster coronatus (Forbes)**

**E 2562** Cretaceous, Cenomanian. Lower Chalk. Burham, Kent, England. Smith, Mrs M. H. Colln 1878. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 82, 83, pl. 19 figs 1, 1a as *Pentaceros coronatus* Forbes; 1907: 125 as *Stauranderaster coronatus* (Forbes).

**E 54031** Cretaceous, Cenomanian. lower part of Grizzle, 3.13 below standard datum. White Hart Sand Pit, Wilmington, Devon, England, SY 208 999. Gale, A. S. Colln. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 193, 194, 197, pl. 41 figs 2a, b.

**OR 35480** **Holotype** of *Oreaster coronatus* Forbes. Cretaceous, Cenomanian. Lower Chalk. Washington, Sussex, England. Dixon, F. Colln 1850. Type figd Forbes, E. 1848: 467 as *Oreaster coronatus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 327, 328, pl. 21 figs 7, 7a–e as *Oreaster coronatus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 362, 370, 439, pl. 21 figs 7, 7a–e as *Oreaster coronatus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 82, 83, pl. 24 figs 2, 2a–c, pl. 25 fig. 9 as *Pentaceros coronatus* Forbes; 1907: 125 as *Stauranderaster coronatus* (Forbes). Forbes, 1848, in his description of the species, referred to the figures in Dixon, 1850.

**Stauranderaster gibbosus Spencer**

**E 13239** **Holotype**. Cretaceous, Upper Campanian, *quadratus* Zone. Rottingdean, Sussex, England. Presd Faber, H. 1913. Type refd Spencer, W. K. 1913: 135. Figured herein, figs 2a, b.

**E 13240** **Paratype**. Cretaceous, Upper Senonian, *quadratus* Zone. Rottingdean, Sussex, England. Presd Faber, H. 1913. Figd Spencer, W. K. 1913: 135, pl. 13 fig. 11.

**E 13248** Cretaceous, Senonian, lower quarter of *coranguinum* Zone. Whitchurch, Oxfordshire, England. Presd Whithers, T. H. 25th September 1913. Figd Spencer, W. K. 1913: 133, 135, pl. 13 figs 1–3.

**Stauranderaster pistilliferus (Forbes)**

**E 2564** **Syntype** of *Oreaster pistilliferus* Forbes. Cretaceous, Senonian. Upper Chalk. Gravesend, Kent, England. Old Colln. Figd Forbes, E. in Dixon, F. 1850: 329, possibly

right-centre of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 363, 370, possibly right-centre of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 88, pl. 25 fig. 5 right as *Pentaceros pistilliferus* Forbes.

**E 5037** (ex. 57634) **Syntype** of *Oreaster pistilliferus* Forbes. Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln 1873. Figd Forbes, E. in Dixon, F. 1850: 329, possibly left-centre of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 363, 370, possibly left-centre of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 88, pl. 25 fig. 5 left, as *Pentaceros pistilliferus* Forbes.

**OR 57634** **Syntype** of *Oreaster pistilliferus* Forbes. Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Simmons, J. Colln 1873. Figd Forbes, E. in Dixon, F. 1850: 329, probably upper right of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 363, 370, probably upper right of pl. 21 fig. 15 as *Oreaster pistilliferus* Forbes. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 88, pl. 25 fig. 5 centre as *Pentaceros pistilliferus* Forbes.

#### **Stauranderaster senonensis Valette**

**E 2561** **Holotype** of *Pentaceros punctatus* Spencer. Cretaceous, Senonian. Upper Chalk. 'England'. Old Colln. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 88, pl. 26 figs 1, 1a, b as *Pentaceros punctatus* Spencer; 1907: 95 as *Pycinaster senonensis* Valette.

#### **Stauranderaster senonensis (Valette)**

**E 2561** See: *Stauranderaster senonensis* Valette

**E 20431** Cretaceous, Campanian, *quadratus* Zone. East Harnham, near Salisbury, Wiltshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 96, 119, text figs 23a–c as *Pycinaster senonensis* Valette.

#### **Stauranderaster sp.**

**E 2568** Cretaceous. Chalk. Sussex?, England. Old Colln. Figd Forbes, E. in Dixon, F. 1850: pl. 23 fig. 16 as '... fragment of *Goniaster* sp. ...'. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: pl. 23 fig. 16 as '... fragment of *Goniaster* sp. ...'.

**E 7401** Cretaceous, probably Senonian. Devon, England. Bequest Vicary November 1903. Type figd Gislén, T. 1925: 28–30, figs 56–59 as *Gasterometra polycirra* Gislén. Refd Nielsen, K. B. 1943: 61. Erroneously described as a Comatulid crinoid by Gislén; referred to *Stauranderaster* by Nielsen.

#### **Stellaster sharpii Wright**

**OR 75792** See: '*Metopaster*' *sharpii* (Wright)

#### **Sturtzura brisingoides Gregory**

**E 13000, E 13002** See: *Sturtzura brisingoides* (Gregory)

#### **Sturtzura brisingoides (Gregory)**

**E 13000** **Syntype** of *Protaster brisingoides* Gregory. **Lectotype** of *Sturtzura brisingoides* Gregory. **Type species** of *Sturtzura* Gregory, 1889: 24–27. Upper Silurian. Melbournian Series, Mayhill Sandstone. Moonee Ponds, Flemington, near Melbourne, Victoria, Australia. Presd McKnight, F. 1889. Type figd Gregory, J. W. 1889: 24–27, text figs 1, 2 as *Protaster brisingoides* Gregory. Type refd Gregory, J. W.

1897 (for 1896): 1034–1035. Type figd Spencer, W. K. (1914–1940) 1927: 356, 363, 365, 366, text fig. 233B. E 13000 and E 13002 are part and counterpart.

**E 13002** **Syntype** of *Protaster brisingoides* Gregory. **Lectotype** of *Sturtzura brisingoides* Gregory. **Type species** of *Sturtzura* Gregory, 1889. Upper Silurian. Melbournian Series, Mayhill Sandstone. Moonee Ponds, Flemington, near Melbourne, Victoria, Australia. Presd McKnight, F. 1889. Type refd Gregory, J. W. 1897 (for 1896): 1034–1035. Type figd Spencer, W. K. (1914–1940) 1927: 356, 362, 363, 365, 366, text fig. 232B. E 13000 and E 13002 are part and counterpart. E 13002 is not cited by Gregory 1889, although it is a syntype of *Protaster brisingoides* Gregory.

#### **Sturtzura spryi Chapman**

**E 13001** **Syntype** of *Protaster brisingoides* Gregory. Upper Silurian. Melbournian Series, Mayhill Sandstone. Moonee Ponds, Flemington, near Melbourne Victoria, Australia. Presd McKnight, F. 1889. Type figd Gregory, J. W. 1889: 24–27, text fig. 3 as *Protaster brisingoides* Gregory.

## T

#### **Teichaster favosus Spencer**

**E 13238, E 13297–301** See: *Crateraster favosus* (Spencer)

#### **Teichaster stokesii (Forbes)**

**E 52239, 44** (ex. 57502) Eocene. London Clay. Isle of Sheppey, Kent, England. Bowerbank Colln 1850. Figd Forbes, E. 1852: pl. 4 figs 6a (E 52239, fig. reversed), 6b, 6c? (E 52244) as *Goniaster stokesii* Forbes.

**OR 38587** Eocene. London Clay. Isle of Sheppey, Kent, England. Griffiths, W. Colln. Purchd October 1858. Figd Rasmussen, H. W. 1972: 53, pl. 12 fig. 5 (under E 38587).

#### **Terminaster cancriformis (Quenstedt)**

**E 53615–17** Jurassic. Oxford Clay. Woodham Brick Pit, Buckinghamshire, England. Colld Beatson, S. Presd 4th June 1961. Figd Hess, H. 1974: 649, 650, text fig. 2 (E 53615); 648, 650, 651, text fig. 1 (E 53616); 649, 650, text fig. 3 (E 53617).

#### **Tetraster sp**

**E 52383** See: *Cnemidactis girvanensis* (Schuchert)

#### **Tholaster argus Spencer**

**E 20967** See: *Valettaster argus* (Spencer)

#### **Tomidaster sulcatus Sladen**

**E 5063** See: *Ophryaster sulcatus* (Sladen)

#### **Trachyaster radiatus Spencer**

**E 13303** See: *Spenceraster radiatus* (Spencer)

#### **Tropidaster pectinatus Forbes**

**E 1861** **Syntypes?** **Type species** of *Tropidaster* Forbes 1850: 1–2. Jurassic, Pliensbachian, *capricornus* Zone. Lias. Cutting at south end of Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. (civil engineer). Wright, T. Colln. Type refd Forbes, E. 1850c: 1–2, pl. 3. Figd Wright, T. (1863–1880) 1863: 102–103, pl. 3 fig. 1. These are probably some of the specimens referred to by Forbes in his description of the species and therefore may be syntypes.

**E 1902** Jurassic, Pliensbachian, *capricornus* Zone. Lias. Cutting at south end of Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. (civil engineer). Wright, T. Colln. Purchd Butler, F. H. April



1888. Figd Wright, T. (1863–1880) 1863: 102–103, pl. 3 fig. 3. These are not the specimens referred to by Forbes (1850) and are not syntypes. They were found subsequent to the description, as mentioned by Wright: 103.

**E 13570** (ex. 75692) **Syntype?** **Type species** of *Tropidaster* Forbes 1850. Jurassic, Pliensbachian, *capricornus* Zone. Lias. Cutting at south end of Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. (civil engineer). Purchd May 1875. Type refd Forbes, E. 1850c: 1–2, pl. 3. Perhaps amongst the specimens referred to by Forbes in his description of the species and therefore one of the syntypes.

**OR 75690–1** **Syntype.** **Type species** of *Tropidaster* Forbes 1850: 1–2. Jurassic, Pliensbachian, *capricornus* Zone. Lias. Cutting at south end of Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. (civil engineer). Wright, T. Colln. Type figd Forbes, E. 1850c: 1–2, pl. 3 figs 1 (75960), 2,3 (75961).

#### ***Tropidaster tropidatus* Forbes**

**OR 75692** **Syntype?** Jurassic, Pliensbachian, *capricornus* Zone. Lias. Cutting at south end of Mickleton Tunnel, near Chipping Campden, Gloucestershire, England. Colld Gavey, G. E. (civil engineer). Purchd May 1875. Type refd Forbes, E. 1850c: 1–2, pl. 3. Perhaps this is one of the specimens referred to by Forbes, and if so, it is one of the syntypes.

## U

#### ***Uraster gaveyi* Forbes**

**E 1638** See: '*Asterias*' *gaveyi* (Forbes)

#### ***Uraster spiniger* Wright**

**E 1642** See: *Compsaster spiniger* (Wright)

#### ***Urasterella girvanensis* Schuchert**

**E 52383** See: *Cnemidactis girvanensis* (Schuchert)

#### ***Urasterella mantana* (Stschurowsky)**

**E 3806** Carboniferous. Mjatschowa, near Moscow, Russia. Purchd Damon, R. November 1896. Figd Spencer, W. K. (1914–1940) 1918: 122, 131, 147, 148, text fig. 93.

#### ***Urasterella ruthveni* (Forbes) var. *leintwardinensis* Spencer**

**E 13952** **Holotype.** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchd January 1947. Figd La Touche, J. de 1884: 76, pl. 17 fig 546 as *Palaeaster* sp. Type figd Spencer, W. K. (1914–1940) 1918: 127, 128, 130, 131, 138, 142–144, text fig. 92, pl. 9 figs 3, 4.

#### ***Urasterella thraivensis* Spencer**

**E 52407Aa,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 127, 137–139, pl. 10 fig. 1 (E 52407Aa); 137, 139 (E 52407Ab). E 52407A is referred to as *Urasterella girvanensis* on p. 303, and listed with *Encrinaster grayae* on p. 420 (1930).

**E 52418a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 126–129, text fig. 81; E 52418a: 137, 139, 151.

**E 52485** **Lectotype.** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive

Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 127, 128, 137, 139, text fig. 88, pl. 9 fig. 1. Type refd Owen, H. G. 1965. Selected by Owen to be the lectotype.

**E 53290** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Colld Gray, Mrs. R. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1918: 127, 137–139, pl. 9 fig. 2.

## V

#### ***Valettaster argus* (Spencer)**

**E 2566** **Paratype** of *Stauranderaster argus* Spencer. Cretaceous. Chalk. Sussex, England. Dixon, F. Colln? Figd Forbes, E. in Dixon, F. 1850: pl. 21 fig. 16 as *Oreaster* sp. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 439, pl. 21 fig. 16 as *Oreaster* sp. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: pl. 25 figs 6, 6a, as Genus(?) sp.(?); 1907: 99, 100, pl. 29 figs 9, 9a as *Stauranderaster argus* Spencer.

#### ***Valettaster argus* (Spencer)**

**E 4344b** Cretaceous. Upper Chalk. Charlton, Kent, England. Ogle Colln. Purchd 27th June 1891. Figd Breton, G. 1985: 93, 99, fig. 7 (under E 4344). See also *Stauranderaster bulbiferus* (Forbes), E 4344a. The block of Chalk contains *S. bulbiferus* and *V. argus*.

**E 5019** **Holotype** of *Stauranderaster argus* Spencer. Cretaceous, Campanian, *Marsupites* Zone. Brighton, Sussex, England. Presd McPherson, W. November 1901. Type refd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 99 as *Stauranderaster argus* Spencer.

**E 20294** **Paratype** of *Stauranderaster argus* Spencer. Cretaceous, Santonian, *coranguinum* Zone. Micheldever, Hampshire, England. Blackmore, H. P. Colln. Presd Trustees, Salisbury Museum January 1935. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 99, 100, pl. 19 figs 8, 8a as *Stauranderaster argus* Spencer. Figd Breton, G. 1985: 93, fig. 6.

**E 20967** Cretaceous, Santonian, *cortestudinarium* Zone. Seaford, Sussex, England. Rowe, A. W. Colln. Purchd November 1926. Figd Spencer, W. K. 1913: 138, pl. 13 fig. 23 as *Tholaster argus* Spencer.

#### ***Valettaster ocellatus* (Forbes)**

**E 2571** **Holotype** of *Oreaster ocellatus* Forbes. **Type species** of *Valettaster* Lambert 1914: 27. Cretaceous, Upper Senonian. Sussex, England. Dixon, F. Colln 1850. Type refd Forbes, E. 1848: 468 as *Oreaster ocellatus* Forbes. Figd Forbes, E. in Dixon, F. 1850: 329, pl. 21 fig. 13 as *Oreaster ocellatus* Forbes. Figd Forbes, E. in Dixon, F. & Jones, T. R. 1878: 364, 370, 439, pl. 21 fig. 13 as *Oreaster ocellatus* Forbes. Type refd Lambert, J. 1914: 27. Forbes 1848, in his description of the species, referred to the figures in Dixon 1850.

**E 5012** Cretaceous, Upper Santonian. Upper Chalk, *Marsupites* Band. Between tide-marks, near Roedean College, Brighton, Sussex, England. Presd McPherson, W. 1901. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1905: 85, 86, pl. 25 figs 4, 4a as *Pentaceros ocellatus* Forbes. Figd Breton, G. 1985: 93, 98, fig. 5.

**E 54359** (ex. Wright & Wright colln no. 2506) Cretaceous, Cenomanian. Pit 2, Wilmington, Devon, England. Wright, C. W. & E. V. Colln. Presd March 1977. Figd Gale, A. S., in Smith, A. B., Paul, C. R. C., Gale, A. S. & Donovan, S. K. 1988: 194, 197, pl. 41 figs 1a,b.

## TYPE AND FIGURED FOSSIL OPHIUROIDEA

### A

#### *Acroura brodiei* Wright

E 3769 See: *Sinosura brodiei* (Wright)

#### *Amphiura cretacea* Spencer

E 5059 **Holotype**. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Folkestone, Kent, England. Capron, J. R. Colln. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 104, 107, pl. 28 figs 6, 6a. The specimen is associated with a paratype of *Ophiotitanos tenuis* Spencer.

#### *Amphiura prattii* Forbes

OR 24682 See: *Ophiochiton? prattii* (Forbes)

OR 35607 See: *Dermocoma wrighti* Hess

#### *Amphiura?senonensis* Valette

E 13696a,b Cretaceous, Campanian, *quadratus* Zone. Upper of two pits Patching Hill, Worthing, Sussex, England. Cold Gaster, C. T. A. Presd October 1921. Figd Rasmussen, H. W. 1950: 119, 120, pl. 15 figs 6, 7 (E 13696a), 8a–e (E 13696b) as *Amphiura?senonensis* (Valette).

#### *Amphiura?senonensis* (Valette)

E 13696a,b See: *Amphiura?senonensis* Valette

#### *Antiquaster magrumi* Kesling

OR 40296b Silurian, Lower Ludlow. Shales. Church Hill, Leintwardine, Herefordshire, England. Marston, A Colln. Presd 1862. Figd Hotchkiss, F. H. 1976: 8, 9, 14, pl. 9 fig. 1.

#### *Aplocoma* sp

E 1613a,b(1–11) Triassic, Rhaetic. Spinney Hill, near Leicester, Leicestershire, England. Wright, T. Colln. Purchd Butler, F. H. 1887. Figd Hess, H. 1965: 169, 171, 173, text figs 9–20.

#### *Aspidosoma grayae* Spencer

E 52455a,b See: *Encrinaster grayae* (Spencer)

### B

#### *Bdellacoma vermiformis* Salter

E 1259 Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Presd Lee, J. E. 1885. Figd Spencer, W. K. (1914–1940) 1940: 511, 512, 527, 528, 529, text figs 335D, 342A, pl. 36 fig. 4.

OR 40297 Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Old Colln. Figd Spencer, W. K. (1914–1940) 1940: 511, 512, 527, 528, 529, text figs 335C, 342B, pl. 37 fig. 8.

#### *Belaster ordovicus* Spencer

E 13532 See: *Stenaster obtusus* (Forbes)

#### *Bundenbachia benecke* (Stürtz)

E 3461, 3494 See: *Taeniaster benecke* (Stürtz)

#### *Bundenbachia* sp

E 3495 See: *Taeniaster benecke* (Stürtz)

### C

#### *Caractacaster caractaci* Gregory

E 13531a–c See: *Stenaster obtusus* (Forbes)

#### *Cheiropteraster giganteus* Stürtz

E 3464 **Syntype**. Type species of *Cheiropteraster* Stürtz 1890 : 228–229. **Lectotype**. Lower Devonian. Bundenbach Slates. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 228–229, pl. 29 fig. 33, pl. 30 fig. 32. Type figd Spencer, W. K. (1914–1940) 1934: 444, 445, 446, text fig. 287B. Selected by Spencer as the lectotype.

E 3465 **Syntype?** Lower Devonian. Bundenbach Slates. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1934: 439, 440, 441, 442, 444, 446, text figs 283A, 284, 286, 287A, pl. 29 fig. 4. The specimen may be a syntype of Stürtz.

E 3511 Lower Devonian. Bundenbach Slates. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1894. Figd Spencer, W. K. (1914–1940) 1934: 444, 445, 446, 447, 448, text figs 288, 289.

### D

#### *Dermocoma wrighti* Hess

OR 35607 Jurassic, Bathonian. Forest Marble. Malmesbury, Wiltshire, England. Buy, W. Colln 1856. Figd Wright, T. (1863–1880) 1866: 158–159, pl. 18 fig. 2 as *Amphiura prattii* Forbes. Figd Hess, H. 1964: 789, 792, 796, pl. 10 fig. 2.

#### *Drepanaster grayae* Spencer

E 52402a,b Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1934: 493 (E 52402a,b), pl. 32 fig. 3 (E 52402a); 1940: 496, text fig. 323A (E 52402b).

E 52451a,b **Holotype**. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1934: 452, 475, 493; 1940: 495, 496, text fig. 322 (E 52451a); 1934: 493, 494, text fig. 321; 1940: 496, pl. 32 fig. 1 (E 52451b).

E 52461a,b Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1934: 493 pl. 32 fig. 2 (E 52461b) (not fig. 3 as recorded in plate explanation. That specimen is E 52402a).

E 52495A,B Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1934: 493, pl. 32 fig. 4; 1940: 497 (E 52495A); 1934: 493; 1940: 497, 498, text fig. 325B,C (E 52495B).

E 52696 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1934: 493; 1940: 496, 497, text fig. 323B.

E 52767 Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1940: 497, 498, text fig. 325A.

E 52939a,b Upper Ordovician, Ashgill. Ardmillan Series,



Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Presd Misses Gray June 1937. Figd Spencer, W. K. (1914–1940) 1940: 497, text fig. 324 (E 52939a).

**Drepanaster scabrosus (Whidborne)**

**E 13121a,b** Upper Devonian. Pilton Beds. Downend, near Saunton, North Devon, England. Presd Workman, Miss R. 29th July 1910. Figd Spencer, W. K. (1914–1940) 1934: pl. 29 fig. 6; 1940: 499 (E 13121a).

**E 13737a,b** Upper Devonian. Pickard's Down, near Barnstable, Devon, England. Colld Hamling, J. G. Presd October 1925. Figd Spencer, W. K. (1914–1940) 1940: 499, text fig. 326c.

## E

**Encrinaster grayae (Spencer)**

**E 52411a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 420, pl. 20 fig. 6 (E 52411a); 420, 423, pl. 26 fig. 7 (E 52411b).

**E 52452a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 403, 410, 420, 421, 422, 423, text fig. 269, 271; 1934: 456 (E 52452a); 1930: 406, 420, text fig. 260, pl. 27 fig. 5; 1934: 450 (E 52452b).

**E 52455a,b** **Holotype** of *Aspidosoma grayae* Spencer. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1914: 23, 24, 25, 33, text figs 22, 24, pl. 1 fig. 8; 1930: 403, 409, 410, 420, 421–423, text figs 259B, 269, 272, pl. 26 figs 1, 2, 3 (E 52455a); 1914: 23, 24, 25, 33, text figs 22, 24; 1930: 403, 409, 419, 420, 422, text figs 259A, 268, pl. 26 figs 1, 2, 4, pl. 28 fig. 4 (E 52455b) as *Aspidosoma grayae* Spencer.

**E 52757** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 410, 420, 422, 424, text fig. 270.

**Eospondylus primigenius (Stürtz)**

**E 3353** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1925: 257, 276, 310, 311, 312, text figs 206b, e, pl. 21 fig. 9.

**E 3355** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 210–211, pl. 26 fig. 6 as *Ophiura (Ophiurella) primigenia* Stürtz. Figd Spencer, W. K. (1914–1940) 1925: 257, 276, 310, 311, 312, text figs 206c.

**E 3357** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 210, pl. 26 fig. 7 as *Ophiura (Ophiurella) primigenia* Stürtz. Figd Spencer, W. K. (1914–1940) 1925: 257, 276, 310, 311, 312, text figs 206d.

**E 3358** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1925: 257, 276, 310, 311, 312, text figs 206a. Figd Smith, A. B. in Murray, J. W. (editor) 1985: pl. 7.7.2.

**Euzonosoma orbitoides Spencer**

**E 52424a,b** **Holotype**. Type species of *Euzonosoma* Spencer 1930: 411. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1930: 412, 413, 415, text fig. 264, pl. 27 fig. 9; 1934: 478 (E 52424a); 1930: 410, 411, 413, 414, text figs 265, 266, pl. 27 figs 6, 8 (E 52524b).

**E 52426a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 412, 415 (E 52426a); 412, 415, 417, text fig. 267 (E 52426b).

**E 52602a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 407, 410, 413, 415, 417, 423, text fig. 261 (both part and counterpart figd).

**Euzonosoma tischbeinianum (Roemer)**

**E 3475** Lower Devonian. Bundenbach Slates. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1930: 407, 408, 417; 1934: 442; 1940: 501, text fig. 262.

**E 13794** Lower Devonian. Bundenbach, Germany. Purchd Wolff, E. May 1935. Figd Smith, A. B. in Murray, J. W. (editor) 1985: pl. 7.7.1.

## F

**Furcaster leptosoma (Salter)**

**E 3351** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 213, pl. 26 figs 12, 13 as *Ophiura (Palastropecten) zitteli* Stürtz. Figd Spencer, W. K. (1914–1940) 1925: 313, 315, 319, 324, 325, pl. 22 fig. 7.

**E 3352** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1925: 245, 313, 319, 325, pl. 22 fig. 8.

**E 3354** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 211–213, pl. 26 figs 10, 10a, 11 as *Ophiura (Eoluidia) decheni* Stürtz. The specimen was used, together with E 3360, as the basis for the detailed reconstructions in the figures by Stürtz.

**E 3360** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 211–213, pl. 26 fig. 10 as *Ophiura (Eoluidia) decheni* Stürtz. The specimen was used, together with E 3354, as the basis for the detailed reconstructions in the figures by Stürtz.

**E 3364** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 214, pl. 31 fig. 40a as *Furcaster palaeozoicus* Stürtz. Figd Gregory, J. W. in Lankester, E. R. (editor) 1900: 275, text fig. 31. Stürtz based his figure on this specimen and E 3365. His figure was also used by Gregory.

**E 3365** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 214, pl. 31 fig. 40a as *Furcaster palaeozoicus* Stürtz. Figd Gregory, J. W. in Lankester, E. R. (editor) 1900: 275, text fig. 31. Figd Spencer, W. K. (1914–1940) 1925: 314, 316, 319, 322, 324, text fig. 208. Stürtz based the figure on this specimen and E 3364. His figure was also used by Gregory.

**E 3366** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Stürtz, B. 1890: 214, pl. 31

fig. 40 as *Furcaster palaeozoicus* Stüztz. Figd Spencer, W. K. (1914–1940) 1925: 313, 314, 319, 324, text fig. 207. Stüztz based his figure on this specimen and E 3805.

**E 3487** Lower Devonian. Bundenbach, Germany. Stüztz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1925: 313, 319, 325, pl. 22 fig. 6.

**E 3805** Lower Devonian. Bundenbach, Germany. Stüztz, B. Colln. Purchd July 1891. Figd Stüztz, B. 1890: 214, pl. 31 fig. 40 as *Furcaster palaeozoicus* Stüztz. Figd Spencer, W. K. (1914–1940) 1925: 319, 325, pl. 22 fig. 5. Stüztz based his figure on this specimen and E 3366. Gregory, 1897: 1038 referred to the specimen as the type, but the type series are in the Berlin Museum.

**E 5036** Holotype of *Sympterura minveri* Bather. Type species of *Sympterura* Bather 1905: 168. Lower Devonian, 'Coblentian'. Blue slate. Ephaven Cove, between Lundy Beach and Trevan Point, Portquin Bay, St. Minver Parish, near Padstow, North Cornwall, England. Colld Legg, Miss B. Presd Fox, H. March 1905. Type figd Bather, F. A. 1905: 161–169, pl. 6 fig. 6 as *Sympterura minveri* Bather.

**E 13698** Lower Devonian. Dachschiefer. Bundenbach, Hunsrückgebirge, Germany. Stüztz, B. Colln. Purchd 28th October 1922. Figd Spencer, W. K. (1914–1940) 1925: 313, 316, 319, 325, pl. 22 fig. 9.

**E 20250a–c** (ex. Ludlow Museum nos D/d/23 (=E 20250a), D/d/22 XXIII (=E 20250b), D/d/21 VII (=E 20250c)) Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchd January 1947. Figd Spencer, W. K. (1914–1940) 1925: 314, 316, 319, 320, 321, 322, text fig. 212c (E 20250c) as *Lapworthura miltoni* (Salter). Text fig. 212a, p. 321 is identified by its Ludlow Museum number III, which is in fact a specimen of *Lapworthura miltoni* (Salter), BMNH numbers E 20231–2. This is probably an error for VII, and if so, a further page reference will include text fig. 212a on p. 321.

**E 20258** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchd January 1947. Figd Spencer, W. K. (1914–1940) 1925: 316, 319, 321, 322, 325, text fig. 212e.

**E 20260** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Marston, A. Colln in Ludlow Museum Collection. Purchd January 1947. Figd Spencer, W. K. (1914–1940) 1925: 314, 319, pl. 18 fig. 4.

**E 52839a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 315, 317, 318, text fig. 210 as *Furcaster trepidans* Spencer; 1927: 325 (E 52839a) as *Furcaster leptosoma* (Salter).

#### ***Furcaster palaeozoicus* Stüztz**

**E 3364, E3365, E 3366, E 3805** See: *Furcaster leptosoma* (Salter)

#### ***Furcaster trepidans* Spencer**

**E 52413a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 316, 317, pl. 22 fig. 1 (E 52413a).

**E 52511** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 315, 316, 317, text fig. 209.

**E 52685a,b** Holotype of *Squamaster trepidans* Spencer. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1925: E 52685a — 250, 290, text fig. 197c as *Squamaster trepidans* Spencer; 315, 317, as *Furcaster trepidans* Spencer; E 52685b — 250, 272, 273, 274, text fig. 192 as *Furcaster trepidans* Spencer; 290, text fig. 197c as *Squamaster trepidans* Spencer; 309, 313, 317, 318, pl. 22 fig. 2 as *Furcaster trepidans* Spencer.

#### ***Furcaster trepidans* Spencer**

**E 52839a,b** See: *Furcaster leptosoma* (Salter)

## H

#### ***Hallaster cylindricus* (Billings)**

**E 52394a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 249, 251, 256, 257, 293, 295, text figs 178, 185, pl. 19 figs 1, 2, pl. 21 fig. 3; 1927: 335 (E 52394a); 1925: 249, 250, 251, 256, 257, 290, 291, 293, 295, 296, 315, text figs 178, 185, 197a, pl. 21 figs 1, 2; 1927: 335 (E 52394b).

**E 52420a,b** Ordovician, Caradoc. Balclatchie Group. Dow Hill, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 246, 259, 265, 274, 292, 293, 295, 296, 315, text fig. 200; 1927: 325, 420; 1940: 524 (E 52420a).

**E 52682** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1925: 251, 254, 293, 307, text fig. 179; 1930: 410.

#### ***Hemieuryale? lunaris* Hess**

**E 52983–9** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss July 1896. Figd Hess, H. 1964: 763, 764, 765, text figs 4 (E 52983), 5 (E 52984), 6 (E 52985), 7 (E 52986), 8 (E 52987), 9 (E 52988), 10 (E 52989).

#### ***Hudsonaster batheri* Schuchert**

**E 52391** See: *Stenaster obtusus* (Forbes)

## L

#### ***Lapworthura miltoni* (Salter)**

**E 20231–2** Syntypes of *Lapworthura sollasi* Spencer. Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Pardoe, H. & Ludlow Museum Colln of Collection. Purchd January 1947. Type figd Spencer, W. K. (1914–1940) 1914: 25, 31, 32, 33, 37, pl. 1 fig. 10 as *Lapworthura sollasi* Spencer; 1916: 106; 1918: 118; 1925: 302, 303 as *Lapworthura miltoni* (Salter). See also note for E 20250a–c, *Furcaster leptosoma* (Salter).

**E 20235a,b** Neotype. Type species of *Lapworthura* Gregory 1897: 1037. Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. E 20235a, Purchd January 1947; E 20235b, Exchd Ipswich Museum per Spencer, H. E. P. 1964. Type refd Gregory, J. W. 1897 (for 1896): 1037. Type figd Spencer, W. K. (1914–1940) 1925: 302, 304–305, 309, pl. 20 fig. 2 (E



20235b). E 20235a was not referred to by Spencer. E 20235b was selected by Spencer, p.304, to be the 'holotype' in place of the original Salter specimen which was lost. The 'holotype' therefore is the neotype.

**E 20250a-c** See: *Furcaster leptosoma* (Salter)

**E 52442a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914-1940) 1925: 302, 303, pl. 21 fig. 7 (E 52442a); 303, 309 (E 52442b).

**E 52973a,b** Silurian, Lower Ludlow. Quarry at Martins Shell, Leintwardine, Herefordshire, England. Spencer, W. K. ex Beale, A. R. Colln. Presd April 1964. Figd Spencer, W. K. (1914-1940) 1925: 302, pl. 20 fig. 3 (E 52973a).

**E 52982** Silurian, Lower Ludlow. Quarry at Martins Shell, Leintwardine, Herefordshire, England. Spencer, W. K. Colln ex Beale, A. R. Collection. Presd April 1964. Figd Spencer, W. K. (1914-1940) 1925: 243, 256, 302, 305, 306, 308, text fig. 204C; 1927: 327.

**OR 57425** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Old Colln. Figd Gregory, J. W. 1897 (for 1896): 1037 fig. 5.

#### *Lapworthura sollasi* Spencer

**E 20231-2** See: *Lapworthura miltoni* (Salter)

#### *Loriolaster mirabilis* Stürtz

**E 3474** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914-1940) 1934: 439, 448, pl. 29 fig. 5.

**E 3804** Lower Devonian. Bundenbach, Germany. Purchd Damon, R. March 1888. Figd Spencer, W. K. (1914-1940) 1934: 447, 448, text figs B,C.

**E 13662a,b** (ex. E 326) Lower Devonian. Dachschiefer. Bundenbach, Hunsrückgebirge, Germany. Purchd Braun, F. 1883. Figd Spencer, W. K. (1914-1940) 1934: 439, 447, 448, text figs 283B, 290A (E 13662a). Originally the two slabs containing the part and counterpart of E 13662a,b were numbered as E 326. Later on, they were given two registration numbers — E 13660 and E 13662. E 13660 contained one specimen plus the counterpart of E 13662, and E 13662 contained one specimen plus the counterpart of E 13660. To avoid confusion, suffixes a and b have been added to the specimens of each slab. Slab previously numbered E 13660 now contains E 13660a and E 13662b. Slab E 13662 now contains E 13662a and E 13660b.

**E 13789** (ex. E 1029) Lower Devonian. Dachschiefer. Bundenbach, Hunsrückgebirge, Germany. Purchd Damon, R. 29th January 1886. Figd Spencer, W. K. (1914-1940) 1934: 439, 440, 441, 446, 448, text fig. 285.

## M

#### *Mastigactis aranea* (Ruedemann)

**E 52616a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914-1940) 1930: 427, 428, text fig. 275A, pl. 28 fig. 8; 1940: 504 (E 52616a); 1930: 427, 429, text fig. 275B; 1940: 504 (E 52616b).

**E 52621** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd

Spencer, W. K. (1914-1940) 1930: 427, 428, 429, pl. 28 figs 5, 6.

**E 52690** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914-1940) 1930: 427, pl. 28 fig. 7.

#### *Medusaster parvus* Whidborne

**E 53296** **Holotype.** Upper Devonian. North-east of Harford Landkey, Devon, England. Hamling Colln. Presd Trustees, Torquay Museum November 1935. Type figd Whidborne, G. F. (1896-1907) 1898: 205-206, pl. 37 fig. 4.

#### *Medusaster rhenanus* Stürtz

**E 3481** **Syntype.** Type species of *Medusaster* Stürtz 1890: 229-230. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 229-230, pl. 31 figs 34, 35.

**E 3496-98** **Syntypes.** Type species of *Medusaster* Stürtz 1890: 229-230. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type refd Stürtz, B. 1890: 229-230. These are three of the four specimens referred to by Stürtz on page 229.

#### *Miospondylus rhenanus* (Stürtz)

**E 3723** **Holotype.** Type species of *Miospondylus* Gregory 1897: 1039. Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd 1894. Type figd Stürtz, B. 1893: 7-8, pl. 1 figs 1-3 as *Ophiura rhenana* Stürtz. Type refd Gregory, J. W. 1897 (for 1896): 1039. Figd Spencer, W. K. (1914-1940) 1925: 299-301, text fig. 202, pl. 21 fig. 6.

## N

? **var nana**

**E 2593** See: *Sturtzaster marstoni* (Salter)

## O

#### *Ophiochiton? prattii* (Forbes)

**OR 24682** Jurassic, Oxfordian. Oxford Clay. Chippenham, Wiltshire, England. Buy, W. Colln 1850. Figd Wright, T. (1863-1880) 1880: 158-159, pl. 18 figs 1a-d as *Amphiura prattii* Forbes. Figd Hess, H. 1964: 796-799, pl. 10 figs 1a-d.

#### *Ophiocoma hessi* Rasmussen

**E 53635** **Holotype.** Eocene, Bartonian. Lower Barton Beds, Highcliffe Sands, horizon A3. Highcliffe-on-Sea, Hampshire, England. Colld Rundle, A. J. Presd. Type figd Rasmussen, H. W. 1972: 76-77, pl. 6 figs 6a-c.

**E 53636** **Paratype.** Eocene, Bartonian. Lower Barton Beds, Highcliffe Sands, horizon A3. Highcliffe-on-Sea, Hampshire, England. Colld Rundle, A. J. Presd. Figd Rasmussen, H. W. 1972: 76-77, pl. 6 fig. 7.

#### *Ophiocoma? nereida* (Wright)

**E 1065** **Holotype** of *Ophiurella nereida* Wright. Jurassic, Corallian. Calciferous Grit. Sandsfoot Castle, Weymouth, Dorset, England. Colld Buckman, Prof. J. Presd June 1886. Type figd Wright, T. (1863-1880) 1880: 156-157, text figs 39, 40 as *Ophiurella nereida* Wright. Figd Wright, T. 1882: 56-57, text fig. opposite p. 56 as *Ophiurella nereida* Wright. Figd Wright, T. 1886b: 53-55, text fig. on p. 54 as *Ophiurella nereida* Wright. The specimen has been damaged since figuring by Wright.

**Ophiocoma? rasmusseni Hess**

**E 13734B Holotype.** Cretaceous, Cenomanian. Lower Chalk, Grey Chalk. Dover, or Folkestone, perhaps Abbotscliff, about midway between Dover and Folkestone, Kent, England. Dibley, G. E. Colln. Purchd October 1922. Type figd Hess, H. 1960b: 747, 748, 752, 753–756, text figs 1B, 5–7.

**Ophiocten? sp.**

**E 52997** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss July 1896. Figd Hess, H. 1964: 768, 771, text fig. 18.

**Ophioderma gaveyi Wright**

**E 1640, E 2655** See: *Palaeocoma gaveyi* (Wright)

**Ophioderma griesbachii Wright**

**E 1561, E 1615** See: *Ophiomybrus griesbachii* (Wright)

**'Ophioderma' tenuibrachiata Forbes**

**E 1641** Jurassic, Pliensbachian, *margaritatus* Zone. Middle Lias, Starfish Bed. Down Cliff, near Bridport Harbour, Dorset, England. Wright, T. Colln. Purchd Butler, F. H. 1887. Figd Wright, T. (1863–1880) 1866: 146, pl. 18 figs 5a–c.

**Ophioglypha wetherelli (Forbes)**

**E 13702** See: *Ophiura wetherelli* Forbes

**Ophiomybrus griesbachii (Wright)**

**E 1561 Syntype** of *Ophioderma griesbachii* Wright. **Lectotype.** Jurassic, Bathonian. Forest Marble. Oundle, Northamptonshire, England. Colld Griesbach, Rev. A. W. Wright, T. Colln. Purchd Butler, F. H. 1887. Type figd Wright, T. 1854: 378–380, pl. 13 figs 2a,b (figures reversed) as *Ophioderma griesbachii* Wright. Figd Wright, T. (1863–1880): 1866: 131, pl. 18 figs 3a,b, and possibly fig. 4; 1880: 155 as *Ophiurella griesbachii* Wright. Type refd Hess, H. 1964: 787. Hess referred to the specimen as the holotype, but as it is one of the figured syntypes of Wright, the specimen is in fact the lectotype.

**E 1615 Syntype?** of *Ophioderma griesbachii* Wright. Jurassic, Bathonian. Forest Marble. Oundle, Northamptonshire, England. Colld Griesbach, Rev. A. W. Wright, T. Colln. Purchd Butler, F. H. 1887. Type refd Wright, T. 1854: 378–380 as *Ophioderma griesbachii* Wright. This is probably one of the specimens from which the species was described by Wright. It is probably therefore an unfigured syntype.

**E 52373** (ex. 56865) Jurassic. Great Oolite, Forest Marble. Oundle, Northamptonshire, England. Morris Colln. Figd Hess, H. 1964: 787, 788, pl. 5.

**Ophiopsis murravii Forbes**

**E 1560, E 1859** See: *Ophiomusium murravii* (Forbes)

**Ophiopsis ramsayi Wright**

**E 1862** See: *Ophiomusium? ramsayi* (Wright)

**Ophiomusium murravii (Forbes)**

**E 1560** Jurassic. Middle Lias, [top Lower Lias]. Near Staithes, Coast of Yorkshire, England. Colld Murray, Dr. Wright, T. Colln. Purchd Butler, F. H. 1887. Figd Wright, T. (1863–1880) 1866: 151–152, pl. 14 figs 1a,b, pl. 19 fig 2 as *Ophiopsis murravii* Forbes.

**E 1859** Jurassic. Middle Lias, [top Lower Lias]. Near Staithes, Coast of Yorkshire, England. Colld Murray, Dr. Wright, T. Colln. Purchd Butler, F. H. 1887. Figd Wright, T. (1863–1880) 1866: 151–152, pl. 17 figs 2a,b as *Ophiopsis murravii* Forbes.

**Ophiomusium cf murravii (Forbes)**

**E 52990–93** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 765, 766, text figs 11 (E 52990), 12 (E 52991), 13 (E 52992), 14 (E 52993).

**E 53001–2** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 765, 767, 769, text figs 22 (E 53001), 23 (E 53002).

**Ophiomusium cf murravii (Forbes) or Ophiura? astonensis Hess**

**E 53014** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 773, 774, 775, text fig. 35.

**Ophiomusium sp.**

**E 13734C** Cretaceous, Cenomanian. Grey Chalk. Dover, or Folkestone, perhaps Abbotscliff, about midway between Dover and Folkestone, Kent, England. Dibley, G. E. Colln. Purchd October 1922. Figd Hess, H. 1960b: 747, 748, 756, text figs 1C, 8.

**Ophiomusium weymouthiense (Damon)**

**E 1607a** Jurassic. Oxford Clay. Weymouth, Radipole Backwater, or Ham Cliff, Dorset, England. Wright, T. Colln. Purchd Butler, F. H. 1887. Figd Hess, H. 1964: 782, pl. 2 fig. 2.

**E 1607b Neotype.** Jurassic. Oxford Clay. Weymouth, Radipole Backwater, or Ham Cliff, Dorset, England. Wright, T. Colln. Purchd Butler, F. H. 1887. Type figd Hess, H. 1964: 780–783, text fig. 41, pl. 4.

**E 3500A** Jurassic, Oxfordian. Weymouth, Radipole Backwater, or Ham Cliff, Dorset, England. Purchd Damon, R. Figd Hess, H. 1964: 782, pl. 3.

**Ophiomusium? ramsayi (Wright)**

**E 1862 Syntype** of *Ophiopsis ramsayi* Wright. Jurassic. Lower Lias, associated with *Isocrinus tuberculatus*. Down Hatherley, Vale of Gloucester, Gloucestershire, England. Wright, T. (ex Brodie, Rev. P. B.) Colln). Purchd Butler, F. H. April 1888. Type figd Wright, T. (1863–1880) 1866: 150–151, pl. 14 fig. 3 as *Ophiopsis ramsayi* Wright.

**Ophiopetra bathonica Hess**

**E 52353 Holotype.** Jurassic, Bathonian. Forest Marble. Chippenham, Wiltshire, England. Spath, L. F. Colln. Presd Spath, J. May 1957. Type figd Hess, H. 1964: 793–795, text figs 46–48, pl. 8.

**Ophiotitanos laevis Spencer**

**E 5053** (ex. 57512) **Holotype.** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Dover, Kent, England. Purchd Griffiths, W. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 105, pl. 28 figs 3, 3a.

**E 5058** (ex. 76004) Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Folkestone, Kent, England. Purchd Capron, J. R. 1879. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 104, 105, pl. 28 figs 4, 4a.

**Ophiotitanos magnus Spencer**

**E 5060** (ex. 76004) **Holotype.** Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Folkestone, Kent, England. Capron Colln. Purchd 1879. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 106, pl. 28 figs 5, 5a.



**Ophiotitanos tenuis** Spencer

**E 5056** (ex. 76004) **Holotype**. Type species of *Ophiotitanos* Spencer 1907: 104. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Folkestone, Kent, England. Capron Colln. Purchd 1879. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 104–105, pl. 28 figs 1, 1a.

**E 5057** (ex. 76004) **Paratype**. Cretaceous, Cenomanian, *subglobosus* Zone. Grey Chalk. Folkestone, Kent, England. Capron, J. R. Colln. Purchd 1879. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 104, pl. 28 figs 2, 2a.

**E 13734A** Cretaceous. Grey Chalk. Dover, or Folkestone, perhaps Abbotscliff, about midway between Dover and Folkestone, Kent, England. Dibley, G. E. Colln. Purchd October 1922. Figd Hess, H. 1960b: 747, 748, 749, 750, 751, text figs 1A, 2–4.

**Ophiura bartonensis** Rasmussen

**E 52158** (ex. 33394) **Holotype**. Eocene, Bartonian. Barton Beds, Highcliffe Sands. Highcliffe-on-Sea, near Barton-on-Sea, Hampshire, England. Presd d'Urban, J. May 1854. Type figd Rasmussen, H. W. 1972: 68–70, pl. 9 fig. 2, pl. 14 fig. 2.

**E 53651–2** Eocene, Bartonian. Barton Beds, horizon A3. Highcliffe-on-Sea, near Barton-on-Sea, Hampshire, England. Colld Rundle, A. J. Presd. Figd Rasmussen, H. W. 1972: pl. 9 figs 3a–d (E 53651), 4 (E 53652).

**E 53653–7** Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Figd Rasmussen, H. W. 1972: pl. 9 figs 5 (E 53653), 6a–c (E 53654), 7a,b (E 53655), 8a,b (E 53656), 9a–c (E 53657).

**E 53673–4** Eocene, Bartonian. Lower Barton Beds, horizon A3. Highcliffe-on-Sea, near Barton-on-Sea, Hampshire, England. Colld Rundle, A. J. Presd. Figd Rasmussen, H. W. 1972: pl. 14 figs 3 (E 53673), 4 (E 53674).

**Ophiura bogneriensis** Rasmussen

**E 13761** **Holotype**. Eocene. London Clay, Starfish Bed. Bognor Regis, Sussex, England. Colld Venables, E. M. Presd March 1928. Type figd Rasmussen, H. W. 1972: 66–68, pl. 8 figs 1a–b.

**E 53642–50** **Paratypes**. Eocene. London Clay, *Astarte* Bed (E 53642–46), Starfish Bed (E 53647–50). Bognor Regis, Sussex, England. Rundle, A. J. Colln. Figd Rasmussen, H. W. 1972: 67, pl. 8 figs 2a–c (E 53642), 3a–d (E 53643), 4 (E 53644), 5 (E 53646), 7a–c (E 53647), 8a,b (E 53648), 9a,b (E 53649), 10a–c (E 53650).

**Ophiura carpelloides** Rasmussen

**E 53658** **Holotype**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Type figd Rasmussen, H. W. 1972: 71–75, pl. 10 figs 1a–d.

**E 53659–66** **Paratypes**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Figd Rasmussen, H. W. 1972: 71, pl. 10 figs 2a,b (E 53659), 3a–c (E 53660), 4a,b (E 53661), 5 (E 53662), 6a,b (E 53663), 7a,b (E 53664), 8a,b (E 53665), 9a–c (E 53666).

**Ophiura costata** Rasmussen

**E 53637** **Holotype**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton Cliff, Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Type figd Rasmussen, H. W. 1972: 70–71, pl. 6 figs 8a–c.

**E 53638** **Paratype**. Eocene, Bartonian. Middle Barton

Beds, horizon E. Barton Cliff, Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Figd Rasmussen, H. W. 1972: 70–71, pl. 6 figs 9a–c.

**Ophiura davisii** Rasmussen

**E 53667** **Paratype**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Figd Rasmussen, H. W. 1972: 75, pl. 10 figs 10a–c.

**E 53668** **Holotype**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Type figd Rasmussen, H. W. 1972: 75, pl. 10 figs 11a–c.

**E 53669–72** **Paratypes**. Eocene, Bartonian. Middle Barton Beds, horizon E. Barton-on-Sea, Hampshire, England. Davis, A. G. Colln. Figd Rasmussen, H. W. 1972: 75, pl. 10 figs 12a–c (E 53669), 13a,b (E 53670), 14a,b (E 53671), 15a,b (E 53672).

**Ophiura (Eoluidia) decheni** Stürtz

**E 3354, E 3360** See: *Furcaster leptosoma* (Salter)

**Ophiura (Ophiurella) primigenia** Stürtz

**E 3355, E 3357** See: *Eospondylus primigenius* (Stürtz)

**Ophiura (Palastropecten) zitteli** Stürtz

**E 3351** See: *Furcaster leptosoma* (Salter)

**Ophiura parvisentis** Spencer

**E 5052** See: *Ophiura serrata* Roemer

**Ophiura rhenana** Stürtz

**E 3723** See: *Miospondylus rhenanus* (Stürtz)

**Ophiura serrata** Roemer

**E 5043** (ex. 48082) Cretaceous. Upper Chalk. Bromley, Kent, England. Dixon, F. Colln. Figd Forbes, E. *in* Dixon, F. 1850: 337, pl. 23 fig. 2. Figd Forbes, E. *in* Dixon, F. & Jones, T. R. 1878: 369, 370, pl. 23 fig. 2. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 102, 103, pl. 27 figs 3, 3a.

**E 5044** (ex. 48082) Cretaceous. Upper Chalk. Bromley, Kent, England. Dixon, F. Colln. Figd Forbes, E. *in* Dixon, F. 1850: pl. 23 fig. 3. Figd Forbes, E. *in* Dixon, F. & Jones, T. R. 1878: pl. 23 fig. 3.

**E 5045** (ex. 48082) Cretaceous. Upper Chalk. Bromley, Kent, England. Dixon, F. Colln. Figd Forbes, E. *in* Dixon, F. 1850: pl. 23 fig. 3a. Figd Forbes, E. *in* Dixon, F. & Jones, T. R. 1878: pl. 23 fig. 3a.

**E 5046** (ex. 46776) Cretaceous, Santonian, *coranguinum* Zone. Chalk. Northfleet, Kent, England. Purchd Tennant, J. 1869. Figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 102, 103, pl. 27 figs 3b–c.

**E 5052** (ex. 46776) **Holotype** of *Ophiura parvisentis* Spencer. Cretaceous, Senonian. Upper Chalk. Bromley, Kent, England. Purchd Simmons, J. 1869. Type figd Sladen, W. P. & Spencer, W. K. (1891–1908) 1907: 103–104, pl. 27 figs 4, 4a as *Ophiura parvisentis* Spencer. The specimen was recorded by Rasmussen, H. W. 1950: 113 as *Ophiura serrata* Roemer, and in a note included with the specimen he wrote ' . . . Ventral side. *O. parvisentum* must be a synonym . . . ', and dated 22/4/1948.

**E 13733a,b** Cretaceous, Santonian, *coranguinum* Zone. Northfleet, Kent, England. Dibley, G. E. Colln October 1922. Figd Rasmussen, H. W. 1950: 113, pl. 16 figs 1a–c (E 13733a), 2a–c (E 13733b).

**Ophiura wetherelli Forbes**

**E 2650–52** **Syntypes?** Eocene. London Clay. Highgate Archway, North London, England. Presd Wetherell, J. W. 1871? Type refd? Forbes, E. 1852: 32–33. These specimens from the Wetherell Collection may be the ones referred to by Forbes on p. 32; if so, they are syntypes. E 2650 figured herein, fig. 5.

**E 2670** **Syntype.** Eocene. London Clay. Highgate Archway, North London, England. Presd Wetherell, J. W. 1871. Type figd Forbes, E. 1852: 32–33 pl. 4 figs 7. Figd Busk, G. 1866: pl. 12 figs 4a–d. Although the original label reads '... original figured specimen ...', the specimen does not resemble any figure by Forbes on pl. 4 figs 7, only that by Busk on pl. 12 fig. 4. Figured herein, fig. 4.

**E 13702** Eocene. London Clay, division 4. Base of Norbiton Pottery Section, New Maldon, Surrey, England. Colld Davis, A. G. Presd December 1923. Figd Davis, A. G. 1923: 113–115, pl. 3 as *Ophioglypha wetherelli* (Forbes). Figd Rasmussen, H. W. 1972: 65, pl. 7 figs 2a,b, pl. 13 fig. 3.

**E 53243a,b** Eocene, Ypresian. London Clay, 2 inches above the basal shell bed, of the Oldhaven Beds. Medway Brick and Sand Company, 'Arethusa Sand Pit', 200 yards west of pier at south end of Beacon Hill, Lower Upnor, Friendsbury Extra, Kent, TQ 759 712. England. Colld Members of the Ninth Symposium on Vertebrate Palaeontology and Comparative Anatomy September 1961. Presd October 1964. Figd Rasmussen, H. W. 1972: 65, pl. 7 fig. 1, pl. 13 fig. 2.

**E 53639–41** Eocene. London Clay, division 2. Victoria Line shaft, Brixton, London, England. Rundle, A. J. Colln. Presd. Figd Rasmussen, H. W. 1972: 65, pl. 7 figs 3a–d (E 53639), 4 (E 53640), 5a,b (E 53641).

**Ophiura? astonensis Hess**

**E 52994–5** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 766, 767, 768, text figs 15 (E 52994), 16 (E 52995).

**E 52996** (ex. E 13085) **Holotype.** Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Type figd Hess, H. 1964: 767–768, text fig. 17.

**Ophiura? astonensis Hess**

**E 53014** See: *Ophiomusium cf murravii* (Forbes)

**Ophiura? substriata Rasmussen**

**E 13116** **Holotype.** Cretaceous, Lower Senonian. Chalk. Dover, Kent, England. Bequeathed Cockburn, C. F. 1909. Type figd Rasmussen, H. W. 1950: 116–118, pl. 18 figs 1–6.

**Ophiurella griesbachii Wright**

**E 1561** See: *Ophiohybris griesbachii* (Wright)

**Ophiurella nereida Wright**

**E 1065** See: *Ophiocoma? nereida* (Wright)

**Ophiurina lymani Stürtz**

**E 3482** **Syntype. Lectotype. Type species of** *Ophiurina* Stürtz 1890: 232. Lower Devonian, Siegenian. Lower Hunsrückschiefer, Asterien-schiefer. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 232, pl. 31 figs 36, 36a. Type refd Owen, H. G. 1965: 558, 559, text fig. 349. Selected as lectotype by Owen, who also suggested the details of the stratigraphy.

**E 3483(0–2)** **Syntypes. Paralectotypes.** Lower Devonian.

Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 232, pl. 21 fig. 37. Figd Spencer, W. K. (1914–1940) 1925: 284, 288, 289, text figs 196a,b, pl. 20 figs 7 (E 3483(1)), 8 upper (E 3483), lower (E 3483(2)). See also E 3482 which is the lectotype.

**P****Palaeocoma egertoni (Broderip)**

**E 21** Jurassic. Lower Lias. Lyme Regis, Dorset, England. Purchd Executors of Tennant, J. June 1881. Figd Hess, H. 1960c: 780–781, text fig. 16.

**E 204** Jurassic. Lower Lias. Lyme Regis, Dorset, England. Tennant Colln. Purchd May 1862. Figd Galopin, R., Lanterno, E. & Célébonovic, S. 1955: 60, pl. 40.

**Palaeocoma gaveyi (Wright)**

**E 1640** Jurassic, Pliensbachian, *capricornus* Zone. Mickleton Tunnel, near Chipping Camden, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. May 1887. Figd Wright, T. (1863–1880) 1866: 147–148, pl. 15 fig. 1 as *Ophioderma gaveyi* Wright.

**E 1903** Jurassic, Pliensbachian, *davoei* Zone, (according to Hess: 784). Middle Lias [top Lower Lias]. Mickleton Tunnel, near Chipping Camden, Gloucestershire, England. Wright, T. Colln. Purchd Butler, F. H. April 1885. Figd Hess, H. 1960c: 783, 784, 785, text figs 19a,b.

**E 2655** **Holotype of** *Ophioderma gaveyi* Wright. Jurassic, Pliensbachian, *capricornus* Zone. 'Upper Shales of the Lower Lias'. Mickleton Tunnel, near Chipping Camden, Gloucestershire, England. Gavey, G. E. Colln 1880. Type figd Wright, T. 1854: 376–378, pl. 13 fig. 1 (figure is reversed) as *Ophioderma gaveyi* Wright. 'Collected by Mr. Gavey ... whilst making the Oxford, Worcester and Wolverhampton Railway ...', (later to be part of the Great Western Railway). The specimen has been damaged since figuring.

**E 52363** (ex. E 3342) Jurassic, *davoei* Zone. Lower Lias. Mickleton Tunnel and cuttings, Gloucestershire, England. Gavey Colln. Purchd Butler, F. H. March 1890. Figd Hess, H. 1960c: 783, 787, text figs 21a,b.

**E 52364** (ex. E 3342) Jurassic, Pliensbachian, *davoei* Zone. Lower Lias. Mickleton Tunnel and cuttings, Gloucestershire, England. Gavey Colln. Purchd Butler, F. H. March 1890. Figd Hess, H. 1960c: 783, 786, 787, text figs 20a,b.

**Palaeocoma milleri (Phillips)**

**E 53000** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 765, 769, text fig. 21.

**E 53015** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 765, 774, text fig. 36.

**E 53101–3** (ex. 19513) Jurassic, Pliensbachian. Kilsby Tunnel, Northamptonshire, England. Purchd Baker, Miss 1845. Figd Hess, H. 1964: 757, 759, 760, text fig. 1 (E 53101, fig. reversed); 758, 759, text fig. 2 (E 53102); 759, 761, text fig. 3 (E 53103).

**E 53826** Jurassic, Pliensbachian. Middle Lias, Rock Bed. No locality data, ?England. No collection data. Figd Smith, A. B. in Murray, J. W. (editor) 1985: pl. 7.7.3.

**Palaeophiura simplex Stürtz**

**E 3484** **Holotype. Type species of** *Palaeophiura* Stürtz 1890: 233. Lower Devonian. Bundenbach, Germany. Stürtz,



B. Colln. Purchd July 1891. Type figd Stürtz, B. 1890: 233, pl. 31 figs 38, 38a, 39. Figd Spencer, W. K. (1914–1940) 1940: 503, 504, text fig. 329.

**Phragmactis grayae** Spencer

**E 52414a,b** **Holotype.** Type species of *Phragmactis* Spencer 1940: 529–532. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Spencer, W. K. (1914–1940) 1940: 507–509, 513, 530–532, text figs 331A, 344, pl. 37 fig. 2 (E 52414a); 510, 532–534, text fig. 345, pl. 37 fig. 1 (E 52414b).

**E 52494** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1940: 530, 532, 539, text fig. 343, pl. 37 fig. 3.

**E 52614a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1940: 532, pl. 37 fig. 4 (E 52614a); 534 (E 52614b).

**E 52941a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Presd Misses Gray June 1937. Figd Spencer, W. K. (1914–1940) 1940: 534, pl. 37 fig. 5 (E 54955a). Gray colln no. K99 was given in the plate explanation, but K98 was given on page 534.

**Protaster piltonensis** Spencer

**E 13835a,b** (ex. Torquay Museum nos 1291 (E 13835a), 1292 (E 13835b)) **Holotype.** Lower Carboniferous, Tournaisian, *Cleistopora* Zone, (according to Spencer 1934: 471 Upper Devonian or Lower Carboniferous, *Cleistopora* Zone). Top Orchard Quarry, Pilton, Devon, England. Presd Torquay Natural History Society per Milton, E. (curator) November 1936. Figd Whidborne, G. F. (1896–1907) 1898: 208–209, pl. 27 figs 2, 2a–c (E 13835a); 208–209, pl. 27 figs 1, 1a (E 13835b) as *Protaster?* (*Drepanaster*) *scabrosus* Whidborne var. Type figd Spencer, W. K. (1914–1940) 1934: 469–471 (E 13835a); 455, 469–471, text figs 303a, 304, pl. 33 fig. 1 (E 13835b).

**Protaster salteri** (Forbes)

**E 13701** Near base of Upper Ordovician, Caradocian, *Mesograptus multidens* Zone, (according to Spencer: 469). Meadowtown Beds. Said to have been picked up from road near Rorrington, Shelve district, Shropshire, England. Colld Jones, J. Presd 13th August 1923. Figd Spencer, W. K. (1914–1940) 1934: 466, 468, 469, pl. 31 fig. 8.

**Protaster? (Drepanaster) scabrosus** Whidborne var

**E 13835a,b** See: *Protaster piltonensis* Spencer

## R

**Rhopalocoma pyrotechnica** Salter

**E 5013a,b** Silurian, Lower Ludlow. Shales. Church Hill, Leintwardine, Herefordshire, England. Bather, F. A. Colln. Presd 1901. Figd Spencer, W. K. (1914–1940) 1940: 511, 512, 535, 536, 539, text figs 335E, 346, pl. 36 fig. 1 (E 5013a); 539, 540 (E 5013b). The reference to text fig. 345 on p. 512 is incorrect and should be text fig. 346.

**OR 40293** **Neotype.** Type species of *Rhopalocoma* Salter 1857: 324–325. Silurian, Lower Ludlow. Shales. Church Hill,

Leintwardine, Herefordshire, England. Marston, N. A. Colln. Type retd Salter, J. W. 1857: 324–325. Type figd Spencer, W. K. (1914–1940) 1940: 507, 509, 510, 513, 537–540, text figs 331D, 332, 347, 348, pl. 36 fig. 2.

## S

**Sinosura brodiei** (Wright)

**E 3769** **Holotype** of *Acroua brodiei* Wright. Jurassic, Pliensbachian, *capricornus* Zone. Middle Lias [top of Lower Lias]. Hewletts Hill, near Cheltenham, Gloucestershire, England. Purchd Brodie, Rev. P. B. October 1895. Type figd Wright, T. (1863–1880) 1866: 153, pl. 17 figs 5a–b (and probably fig. 5c, which is not referred to in the plate explanation, but is referred to on p. 153) as *Acroua brodiei* Wright.

**E 52852a–e** (ex. 18846n) Jurassic. Upper part of Lower Lias. Kilsby Tunnel, Northamptonshire, England. Purchd Baker, Miss 1845. Figd Hess, H. 1964: 775, 778, text fig. 37 (E 52852a); 775, 778, text figs 38–40 (E 52852b–d); 771, 778, pl. 1 (E 52852e).

**E 52854A** (ex. 19511) Jurassic. Upper part of Lower Lias. Kilsby Tunnel, Northamptonshire, England. Purchd Baker, Miss, 1845. Figd Hess, H. 1964: 777, pl. 2 fig. 1.

**E 53003–6** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 770, text fig. 24 (E 53003); 770, text fig. 25 (E 53004); 770, 772, text fig. 26 (E 53005); 770, 772, text fig. 27 (E 53006).

**E 53013** (ex. E 13085) Jurassic. Middle Lias. Aston Magna, Worcestershire, England. Slatter Colln. Purchd Slatter, Miss, July 1896. Figd Hess, H. 1964: 773–775, text fig. 34.

**Squamaster trepidans** Spencer

**E 52685a,b** See: *Furcaster trepidans* Spencer

**Stenaster obtusus** (Forbes)

**E 13531a–c** Upper Ordovician, Caradoc, Lower Bala, *Strophomena expansa* Zone. In lane to Gelli Grin Farmhouse, 2.5 miles southeast of Bala, Gwynedd, North Wales. Ruddy, T. Colln January 1915. Figd Spencer, W. K. (1914–1940) 1916: 80, 81, text fig. 42, pl. 3 fig. 7 (E 13531c); text fig. 43 (E 13531b); 84, 179, pl. 3 fig. 8 (E 13531a) as *Caractacaster caractaci* Gregory.

**E 13532** Upper Ordovician, Caradoc, Lower Bala, *Strophomena expansa* Zone. In lane to Gelli Grin Farmhouse, 2.5 miles southeast of Bala, Gwynedd, North Wales. Ruddy, T. Colln January 1915. Figd Spencer, W. K. (1914–1940) 1916: 74, 75, 179, text fig. 37 pl. 3 fig. 4 as *Belaster ordovicus* Spencer.

**E 52376** **Syntype** of *Tetraster wyvillethomsoni* Nicholson & Etheridge. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Nicholson, H. A. & Etheridge, R. 1880: 324–325, pl. 21 figs 7, 8 as *Tetraster wyville-thomsoni* Nicholson & Etheridge.

**E 52377** **Syntype** of *Tetraster wyvillethomsoni* Nicholson & Etheridge. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Nicholson, H. A. & Etheridge, R. 1880: 324–325, pl. 21 figs 5, 6 as *Tetraster wyville-thomsoni* Nicholson & Etheridge.

**E 52381a,b** *Syntype* of *Tetraster wyvillethomsoni* Nicholson & Etheridge. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Nicholson, H. A. & Etheridge, R. 1880: 324–325, pl. 21 figs 3, 4 (E 52381a) as *Tetraster wyville-thomsoni* Nicholson & Etheridge. On the same block is a specimen figd by Nicholson & Etheridge, pages 328–330, pl. 22 fig. 12, as *Glyptocrinus* sp., no. E 69381a,b. E 69381a is the figured specimen of the crinoid.

**E 52391** *Syntype* of *Tetraster wyvillethomsoni* Nicholson & Etheridge. *Holotype* of *Hudsonaster batheri* Schuchert. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type figd Nicholson, H. A. & Etheridge, R. 1880: 324–325, pl. 21 figs 1, 2 as *Tetraster wyville-thomsoni* Nicholson & Etheridge. Type figd Schuchert, C. 1915: 65, pl. 3 fig. 3 as *Hudsonaster batheri* Schuchert.

**E 52398a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1914: 22, 23, 31, pl. 1 fig. 6; 1919: 173; 1927: 351, 354–356, text figs 225, 231B (E 52398b).

**E 52400a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 347, 349, 356, 358, text fig. 223, pl. 23 figs 2, 3 (E 52400a); 347, 349, 356, 358, text fig. 222, pl. 23 fig. 1 (E 52400b).

**E 52409a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1914: 23, 31, 49, pl. 1 fig. 7; 1925: 263; 1927: 329, 352, 353, 355, 356, 358, 359, text figs 228A, 231A, pl. 24 fig. 10; 1930: 416 (E 52409a); 1927: 345, 353, 356, 358, 359, text fig. 229A, pl. 23 fig. 4 (but not pl. 26 fig. 4 as mentioned on page 356) (E 52409b).

**E 52410a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Hotchkiss, F. H. 1976: 10, pl. 9 fig. 2 (E 52410b).

**E 52431a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 353, 355, 356, 358, text fig. 230, pl. 23 fig. 6 (E 52431a).

**E 52480a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 355, 356, text fig. 231c (E 52480b).

**E 52486** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 345, 349, 350, 352, 354, 358, text fig. 224; 1934: 452, 453, text fig. 249A.

**E 52570a,b** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 351, 352, 353, 356, text fig. 229B; 1934: 470.

**E 52571** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan,

Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 353, 356, text fig. 229C.

**E 52628** Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1927: 345, 356, text fig. 221.

**E 54348** *Syntype* of *Tetraster wyvillethomsoni* Nicholson & Etheridge. Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Type refd Nicholson, H. A. & Etheridge, R. 1880: 324–325 as *Tetraster wyville-thomsoni* Nicholson & Etheridge.

#### **Sturtzaster colvini (Salter)**

**E 13950** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchd January 1947. Figd Spencer, W. K. (1914–1940) 1940: 521, 523, text fig. 340A.

**E 20648** *Neosyntype* of *Sturtzaster colvini* (Salter). Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Ludlow Museum Colln. Purchd January 1947. Figd Spencer, W. K. (1914–1940) 1940: 521, 523, text fig. 340B, pl. 35 fig. 2. Spencer chose two neotypes on p. 521. E 52859 was chosen by Owen, 1965: 547 as the neotype, so E 20648 is the neosyntype.

**E 52859** *Neotype*. Silurian, Lower Ludlow. Church Hill quarry, Leintwardine, Herefordshire, England. Hawkins, H. L. Colln. Presd Department of Geology, Reading University, per Goldring, R. March 1964. Type figd Spencer, W. K. (1914–1940) 1940: 508, 509, 511, 512, 514, 515, 521, 522, 523, text figs 335B, 339, pl. 35 fig. 1, pl. 37, fig. 7. Type refd Owen, H. G. 1965: 547. Spencer chose two neotypes on p. 521. Owen selected E 52859 as the neotype. See also E 20648.

#### **Sturtzaster marstoni (Salter)**

**E 2593** Silurian, Lower Ludlow. Shales. Church Hill, Leintwardine, Herefordshire, England. Holl, H. G. Colln. Purchd from his executors 1887. Figd Spencer, W. K. (1914–1940) 1940: 517, pl. 33 fig. 3 as? var *nana*.

**E 13948** Silurian, Lower Ludlow. Church Hill, Leintwardine, Herefordshire, England. Pardoe, H. Colln. Purchd Ludlow Museum Collection January 1947. Figd Spencer, W. K. (1914–1940) 1940: 518, pl. 37 fig. 6.

#### **Sturtzaster spinosissimus (Roemer)**

**E 13699** Lower Devonian. Dachschiefer. Bundenbach, Hunsrückgebirge, Germany. Stürtz, B. Colln. Purchd 25th November 1922. Figd Spencer, W. K. (1914–1940) 1940: 507, 511, 512, 513, 524, text figs 331B, 335A.

#### **Sympterura minveri Bather**

**E 5036** See: *Furcaster leptosoma* (Salter)

## **T**

#### **Taeniaser benecke (Stürtz)**

**E 3461** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1934: pl. 330 fig. 7 as 1940: 503 as *Bundenbachia benecke* (Stürtz).

**E 3494** Lower Devonian. Bundenbach, Germany. Stürtz, B. Colln. Purchd July 1891. Figd Spencer, W. K. (1914–1940) 1940: 501, 502, text fig. 327 as *Bundenbachia benecke* (Stürtz).

**E 3495** Lower Devonian. Bundenbach, Germany. Stürtz,



B. Colln. Purchd July 1891. Figd Gregory, J. W. 1897 (for 1896): 1034, text fig. 4 (based on the specimen) as *Bundenbachia* sp.

Taeniaster spinosus Billings

E 13120 Ordovician, Trenton Limestone. Belleville, Ontario, Canada. Purchd Smith, W. R. 1st March 1909. Figd Spencer, W. K. (1914–1940) 1925: 254; 1934: 485, 486, 488, text fig. 316.

E 13187 Ordovician, Trenton. Trenton Limestone. Belleville, Ontario, Canada. Purchd Smith, W. R. February 1909. Figd Spencer, W. K. (1914–1940) 1925: 254; 1934: 451, 454, 462, 474, 484–490, 497, text figs 292, 315, 317, 318, 319; 1940: 502.

Tetraster wyville-thomsoni Nicholson & Etheridge

E 52376, E 52377, E 52381a,b, E 52391, E 54348 See: *Stenaster obtusus* (Forbes)

Tetraster wyvillethomsoni Nicholson & Etheridge

E 52376, E 52377, E 52381a,b, E 52391, E 54348 See: *Stenaster obtusus* (Forbes)

U

Urosoma hirudo (Forbes)

E 13480 Lower Devonian, Siegenian, [recorded on label as Lower Coblentian]. Heiligenberg bei Oberstadtfeld, Eifel, Germany. Purchd Dohm, S. 23rd May 1914. Figd Spencer, W. K. (1914–1940) 1934: 437, 438, text figs 282B,C, pl. 29 fig. 2.

E 13792 Lower Devonian, Gedinian/Siegenian. *Orthis monieri* Beds. La Boë en Gahard, Ille et Vilaine, France. Original in the University of Rennes, Faculty of Science. Figd Spencer, W. K. (1914–1940) 1934: 438, pl. 29 fig. 3. The figured specimen is a wax squeeze.

E 52462a,b Upper Ordovician, Ashgill. Ardmillan Series, Drummuck Group, Starfish Bed. Thraive Glen, Girvan, Ayrshire, Scotland. Gray, Mrs R. Colln. Purchd 1920. Figd Spencer, W. K. (1914–1940) 1930: 436, text fig. 280; 1934: 437, text fig. 281 (E 52462a); 1930: 436, text fig. 279, pl. 27 fig. 3; 1934: 437, 438, text fig. 282A (E 52462b).

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 —, *Pentasteria* [A]
- kinahani*, *Petraster* [A]
- laevis*, —, *Ophiotitanos* [O]  
*latum*, *Calliderma* [A]  
*latus*, *Goniaster* (*Astrogonium*) [A]  
*laxata*, *Schuchertia* [A]  
*leintwardinensis*, *Arisaigaster* [A]  
 —, *Mesopalaeaster*(?) [A]  
*leptosoma*, *Furcaster* [O]  
*loirensis*, *Metopaster* [A]  
*lorioli*, *Astropecten* [A]  
 —, *Pentasteria* [A]  
*lunaris*, *Hemieuryale*? [O]  
*lunatus*, *Goniaster* (*Astrogonium*) [A]  
*lymani*, *Ophiurina* [O]
- magnificus*, *Pycinaster* [A]  
*magnus*, *Ophiotitanos* [O]  
 —, *Ophryaster* [A]  
*magrumi*, *Antiquaster* [O]  
*mantana*, *Urasterella* [A]  
*mantelli*, *Goniaster* [A]  
 —, *Goniaster* (*Goniodiscus*) [A]  
 —, *Metopaster* [A]  
*marginatus*, *Chomataster* [A]  
 —, *Nymphaster* [A]  
*marstoni*, *Sturtzaster* [O]  
*megaloplax*, *Pentagonaster* [A]  
*milleri*, *Palaeocoma* [O]  
*miltoni*, *Lapworthura* [O]  
*minveri*, *Sympterura* [O]  
*mirabilis*, *Loriolaster* [O]  
*moretonis*, *Solaster* [A]  
*mosaicum*, *Calliderma* [A]  
*multidactylus*, *Echinodiscus* [A]  
*murchisoni*, *Solaster* [A]  
*murravii*, *Ophiolepis* [O]  
 —, *Ophiomusium* [O]  
*cf murravii*, *Ophiomusium* [O]  
 (see also *astonensis*, *Ophiura*?)
- nereida*, *Ophiocoma*? [O]  
 —, *Ophiurella* [O]
- obtus*, *Nymphaster* [A]  
 —, *Oreaster* [A]  
 —, *Pentagonaster* [A]  
 —, *Stenaster* [O]  
*ocellatus*, *Oreaster* [A]  
 —, *Pentaceros* [A]  
 —, *Valettaster* [A]  
*oligoplax*, *Nymphaster* [A]  
 —, *Ophryaster* [A]  
*orbitoides*, *Euzonosoma* [O]  
*ordovicus*, *Baliactis* [A]  
 —, *Belaster* [O]  
 —, *Protopalaeaster* [A]
- palaeozoicus*, *Furcaster* [O]  
*parkinsoni*, *Goniaster* (*Goniodiscus*) [A]  
*parkinsoni*, *Metopaster* [A]  
*parkinsoni* var. *calcar*, *Metopaster* [A]  
*cf parkinsoni*, *Metopaster* [A]  
*parvisentis*, *Ophiura* [O]  
*parvus*, *Medusaster* [O]  
*pectinatus*, *Tropidaster* [A]  
*petaliformis*, *Compsaster* [A]  
 —, *Jaekelaster* [A]

pichleri, 'Astropecten' [A]  
 piltonensis, Protaster [A]  
 pistilliferus, Oreaster [A]  
 —, Pentaceros [A]  
 —, Stauranderaster [A]  
 polycirra, Gasteromitra [A]  
 portlandicus, Archastropecten [A]  
 —, Pentasteria [A]  
 praecursor, Chomataster [A]  
 prattii, Amphiura [O]  
 —, Ophiociton? [O]  
 primaeva, Palasterina [A]  
 primigenia, Ophiura (Ophiurella) [O]  
 primigenius, Eospondylus [O]  
 primus, Mesopalaeaster [A]  
 procera, Pentasteria [A]  
 punctatus, Pentaceros [A]  
 pygmaeus, Lophidiaster [A]  
 pyrotechnica, Rhopalocoma [O]  
 [\* Crinoid]

quadratus, Metopaster [A]  
 quinqueloba, Crateraster [A]  
 quinqueloba, Pentagonaster [A]

radiatus, Nymphaster [A]  
 —, Spenceraster [A]  
 —, Trachyaster [A]  
 var. radiatus, Metopaster [A]  
 (see tumidus, Metopaster)  
 ramsayi, Ophiopsis [O]  
 —, Ophiomusium? [O]  
 rasmussenii, Ophiocoma? [O]  
 rhenana, Ophiura [O]  
 rhenanus, Helianthaster [A]  
 —, Medusaster [O]  
 —, Miospondylus [O]  
 robustus, Pentagonaster [A]  
 rugatus, Goniaster [A]  
 —, Goniaster (Goniodiscus) [A]  
 —, Metopaster [A]  
 —, Mitraster [A]  
 rugissimus, Metopaster [A]  
 rugosus, Nymphaster [A]  
 —, Spenceraster [A]  
 ruthveni var. leintwardinensis, Urasterella [A]

salteri, Protaster [O]  
 scabrosus, Protaster? (Drepanaster) [O]  
 scabrosus, Drepanaster [O]  
 sculptus, Girvanaster [A]  
 —, Protopalaeaster [A]  
 senonensis, Pycinaster [A]  
 —, Stauranderaster [A]  
 ?senonensis, Amphiura [O]  
 serrata, Ophiura [O]  
 sharpii, 'Metopaster' [A]

—, Stellaster [A]  
 simplex, Eoactis [A]  
 —, Palaeophiura [O]  
 sladeni, Echinasterella [A]  
 smithiae, Calliderma [A]  
 —, Goniaster (Astrogonium) [A]  
 smithii, Goniaster (Astrogonium) [A]  
 solida, Palaeostella [A]  
 sollasi, Lapworthura [O]  
 spenceri, Metopaster [A]  
 spiniger, Compsaster [A]  
 —, Uraster [A]  
 spinosissimus, Sturtzaster [O]  
 spinosus, Echinasterias [A]  
 —, Taeniaster [O]  
 spryi, Sturtzura [A]  
 stokesii, Goniaster [A]  
 —, Teichaster [A]  
 studlandensis, Nymphaster [A]  
 substriata, Ophiura? [O]  
 sulcatus, Ophryaster [A]  
 —, Tomidaster [A]

tamarae, Metopaster [A]  
 tenuibrachiata, 'Ophioderma' [O]  
 tenuis, Ophiotitanos [O]  
 thoracifer, Metopaster [A]  
 thraivensis, Urasterella [O]  
 tischbeinianum, Euzonosoma [O]  
 traquairi, Echinostella [A]  
 trepidans, Furcater [O]  
 —, Squamaster [O]  
 tropidatus, Tropidaster [A]  
 tuberculata, Hippasteria [A]  
 tumidus (probably var. radiatus), Metopaster [A]  
 tumidus, Metopaster [A]

uncatus, Goniaster [A]  
 —, Goniaster (Goniodiscus) [A]  
 —, Metopaster [A]  
 undulatus, Metopaster [A]

vermiformis, Bdellacoma [O]  
 villersensis, Mastaster [A]

wenlocki, Lepidactis [A]  
 wetherelli, Ophioglyphia [O]  
 —, Ophiura [O]  
 weymouthiense, Ophiomusium [O]  
 wittsii, Astropecten [A]  
 —, Pentasteria [A]  
 wrighti, Dermocoma [O]  
 wyville-thomsoni, Tetraster [O]  
 wyvillethomsoni, Tetraster [O]

zitteli, Ophiura (Palastropecten) [O]  
 zonatus, Metopaster [A]